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VOL. VIII.

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No. 1.



OTTAWA, CANADA.

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THE CANADIAN FORESTRY ASSOCIATION.

is the national organization for the informing of public opinion in the effort to secure a rational development of the Canadian Forests through the co-operation of national, provincial and municipal organizations and private enterprises. The objects of the Association are:

- (1) The exploration of the public domain, so that lands unsuitable for agriculture may be reserved for timber production.
- (2) The preservation of the forests for their influence on climate, soil and water supply.
- (3) The promotion of judicious methods in dealing with forests and woodlands.
- (4) Tree planting on the plains, and on streets and highways.
- (5) Reforestation where advisable.
- (6) The collection and dissemination of information bearing on the forestry problem in general.

To promote these ends the Association publishes the *Canadian Forestry Journal*, issues bulletins, arranges for the delivery of free illustrated public lectures, and holds conventions in different parts of Canada.

The Association desires as members all (both men and women) who are in sympathy with this work. The membership fee, which entitles the member to the *Journal*, the annual report and other literature issued, is one dollar per year, (life membership \$10). Applications for membership or requests for information may be addressed to the Secretary, Canadian Forestry Association, Canadian Building, Ottawa, Canada.

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The Thirteenth Annual Convention.

With a larger attendance and more cordent enthusiasm than at any previous gathering in the interests of forest conservation ever held in this country, the thirteenth annual convention of the Canadian Forestry Association was opened yesterday morning. —*Ottawa Citizen.*

To those responsible for the carrying out of this convention, conscious of the many shortcomings and gaps therein, these words and many sim-

ilar ones seem all too kind. At the same time it would be much modesty to pretend that the officers and leading members of the Association are not pleased with the convention and do not realize that in the main lines on which it was planned it was a decided success. The aim was to make this convention as practical as possible, and to inaugurate a forward movement in regard to the handling

of those forest reserves which the different governments in Canada, federal and provincial, have set apart. It did this and more. It demonstrated to the man in the street, that forest conservation is now a matter which must be dealt with. Even to those in touch with the work it revealed greater advances than they had dared to hope for.

But to speak as if this convention were a thing apart, and a success by itself would be entirely wrong. There could have been no convention of value had the foundations not been laid in the past. Not only must one refer to the great convention of 1906, which brought home the national character of the work, but there was the patient work from 1900 when the Association was organized. Even further back than that, as the *Montreal Gazette* reminds us in a most thoughtful article, there was the meeting in that city of the American Forestry Association in the year of its organization (1882) 'when the Houghs, the Littles, the Jolys, the Penhallows and other wise men warned us against the assured nemesis of long generations of indifference.' On that occasion Mr. William Little chartered a large passenger steamer and held her at the wharf for three days that the delegates might have sleeping accommodation. In 1906 Mr. John R. Booth took the delegates out in a special train to see operations in his Madawaska limits. And the labors of Senator Edwards, and Messrs. Herbert M. Price, W. B. Snowball, Aubrey White, E. Stewart, Hiram Robinson, Thomas Southworth, R. H. Campbell and the late rector of Laval University, Mgr. Laflamme, are too much in mind to need recapitulation; work that was generously endorsed and supported on the governmental side by Sir Wilfrid Laurier, Hon. Clifford Sifton, Hon. Sydney Fisher, and by Rt. Hon. R. L. Borden, Hon. Frank Cochrane, Hon. Jules Allard and Hon. W. C. H. Grimmer in their

respective spheres. Then, too, the generous aid of the leading banks of Canada helped to make progress possible. Those who promoted the convention of 1912 often had occasion to say to themselves, 'Other men labored and ye have entered into their labors.'

Coming to the convention held, a review of its leading features shows that the effort was to follow the advice of Hon. Clifford Sifton given at the last meeting at Quebec to 'get something done'. In a word the whole aim was to be as practical as possible. This aim was furthered by the fact that for the first time in the history of the two organizations the Forestry Association and the Lumbermen's Association met at the same time and place. Some fearful ones, believing that the Forestry Association thought the Lumbermen selfish and careless in their operations, and that the Lumbermen deemed the Foresters a body of doctrinaires and impractical theorists, considered it inevitable that there would be a clash and an explosion that would injure the work of both. Instead of this, however, the convention proved a clearing house of ideas and showed that lumbermen and foresters are practically one in aim, and with not nearly so much divergence as to method as had been supposed. Instead of mutual recriminations there were mutual confessions, with the result that because of better understanding there will be better work on the part of both than ever before.

The meetings were held in the Railway Committee Room, which, next to the Commons Chamber, is the largest hall in the building. It seats comfortably somewhat over 250 people and during most of the sessions so many were standing as to bring this number considerably over 300. Viewed from the present moment it might have been better to hold the business sessions in some larger hall down town, but this would in all probability have prevented the attendance of the Right

**Mr. G. Y. Chown.****Ven. Archdeacon R. J. Renison**

Hon. R. L. Borden, Premier, and Sir Wilfrid Laurier, who in the midst of tremendous pressure of their work in the heat of the parliamentary session were still able to devote an hour to the opening and an evening to the banquet. This fact is very much appreciated by all connected with the convention, and it goes to show how deeply in earnest our parliamentary leaders are in assisting the Forestry Association in its work to save the forests.

The Premier and Sir Wilfrid Laurier brought fitting words of welcome to the delegates and started off the meeting with a swing. The President, Mr. Geo. Y. Chown, in his address, demanded a forward step. Then came Mr. MacMillan's paper showing what a forward step would cost and what results it would secure.

Dr. Fernow in his report on forest fire legislation complimented Quebec that the rural clergy there helped in the fight against forest fires by giving warnings from their pulpits, and this fact that forest conservation is

of vital interest to others than those directly connected with it, was brought out at this convention by the attendance of the Very Rev. the Abbot of the Trappist Monastery at Oka, Quebec, which has done so much for the cause of agricultural education, by the presence of a number of Protestant clergymen, as well as the stirring address in which Archdeacon Renison, an Anglican missionary of fifteen years' experience in Northern Ontario on the shores of Hudson Bay, urged the employment of the Indians as fire rangers. Besides this there were accredited delegates from boards of trade, county councils, Canadian clubs, associations of manufacturers, agricultural colleges, women's clubs, fish and game associations, etc.

The widespread appeal which forest conservation makes was evidenced as to its extent by the fact that delegates were in attendance from nearly all the provinces of Canada, including a representative from British Columbia and the Premier of Prince Edward Island, and from a

number of the states of the Union, including, in addition to Mr. Gifford Pinchot of Washington, Mr. E. A. Sterling, Forester of the Pennsylvania Railroad, Dr. J. T. Rothrock, of Pennsylvania, Mr. C. R. Pettis, Superintendent of State Forests, of New York; Dr. E. H. Hall, of New York, Mr. Harris A. Reynolds, Secretary of the Massachusetts Forestry Association, Mr. W. R. Brown, President of New Hampshire Forestry Commission.

The aim of the program committee was as far as possible to have one paper for each of the four business sessions with the object of devoting the remainder of the session to discussion. Here again many believed that a dangerous experiment was being tried, but the full and frank discussion participated in by forest engineers, educators, administrators and lumbermen gave a large amount of valuable information that could have been secured in no other way, and besides brought about a better understanding by each of the aims of the other than has heretofore existed. At times the divergence of view seemed to be great but before the discussions ended in every case the participators were much nearer agreement than when it opened.

The banquet in the Parliamentary Restaurant on Wednesday evening was one of the most successful features of the convention. Covers were laid for 200 guests and nearly every seat was occupied when the assembly sat down. The speaking was of a very high order, and it is safe to say that the Premier and Sir Wilfrid Laurier have never been heard to better advantage. Mr. Pinchot made a most striking speech, which, while it dealt with the general principle of conservation, did not cover any of the ground of his address on the following morning. The speeches of Mr. Alexander MacLaurin and Mr. Wm. McNeil for the lumbermen, and Mr. Nathaniel Curry, President of

the Canadian Manufacturers Association, showed how the conception of the need of forest conservation has gripped the leaders of industry in this country. Here again the united character of the meeting was in evidence. The lumbermen, in addition to the seats allotted to their leaders at the head table, filled two out of the five cross tables, while one side of one of the remaining tables was occupied by graduates or undergraduates of the Forest School of Toronto University.

A striking feature of Thursday morning was, of course, the great address by Mr. Gifford Pinchot on 'The Groundwork of a Forest Service.' The four points necessary to a successful forest service were (1) no politics, (2) enough money, (3) trained men, (4) federal control. A number of those present declared it was the finest address on practical forest conservation and administration that they had ever heard. Mr. R. H. Campbell, Director of Forestry of the Department of the Interior, Canada, in a few words following Mr. Pinchot, told of a visit he had made to some of the national forests of the United States after the reforms made by Mr. Pinchot, as Chief Forester of the United States, had been put into force. He found enthusiasm, intelligence and faithfulness—men with a pride in their work and a determination to keep out fire and other enemies of the forest, and to make it as useful as possible to the people. He hoped to see like results in the Canadian service.

In the afternoon Mr. E. Stewart, first secretary of the Canadian Forestry Association and one of its past presidents, gave his paper on the aims of the Association, holding that it should be an educative and agitating force but should not take up political questions or do administrative work. The various items of the necessary routine business of the Association which showed its finances to be in a healthy condition were

rapidly dealt with, the report of the resolutions and nominations committee presented and adopted and the 13th annual convention concluded.

Wednesday Morning.

At ten o'clock the President of the Association, Mr. G. Y. Clowin, B.A., Registrar of Queen's University, Kingston, called the assembly to order, and introduced the Premier, Right Hon. R. L. Borden.

Mr. Borden, after welcoming those present to Ottawa, briefly referred to the convention of 1906 and the progress of the Association's work since that time. 'We have been happily blessed in Canada,' he continued, 'with not only a great abundance, but a great variety of resources, and perhaps none of the natural resources of Canada which are at the command of our people are more important than those of the forest. We should all bear in mind that a nation, like an individual, may be prodigal. A young man comes into a vast estate; he sees no object more worthy of his attention than dissipating that estate as rapidly as possible. Similarly a young nation like Canada is apt to be reckless of its heritage. I think that every man who has given consideration to the subject will agree that, up to the present time, there has been a lack of thrift on the part of the people of Canada so far as the forests are concerned.'

Referring briefly to the subject of conservation, he observed: 'As we properly understand conservation it means, after all, only wise and efficient utilization . . . Every one of us must realize that good utilization must take place on wise lines and must have regard to the interests, not only of those of the present day, but of the interests of those who come after us as well.

'Burke has well said that the nation is a partnership, but not a partnership of the living alone but a

partnership of those who are living, those who are dead and those who are yet to be born. It is in the spirit of these words, it seems to me, that the question of conservation should be approached.'

After referring to the lack of discrimination between soil fit for farming and that fit only for growing forests up to the present, he went on: 'Everyone who is gifted with the slightest power of observation must realize that the lands have been cleared and settlement made thereon in many places in Canada where the soil would have been infinitely more valuable if the forest had been preserved and the annual crop of the forest used from that land instead of the attempt being made to raise the ordinary crops of agriculture.'

Referring then to the question of forest fires, he concluded: 'No better work could be done by your gathering in this convention than to impress not only upon the Legislature but upon the people at large the importance, nay, the absolute imperative necessity, of such legislation and such concerted action by all interested in this question that this awful destruction by fire shall no longer prevail, but shall be reduced as much as possible. I read in works on conservation which have been recently published in America that in the methods followed by the lumbermen in affording the material that they take from the forest there has been, in the United States at least—a very great and unnecessary waste. I do not know whether you have discussed that or attempted any education of the people in that regard, but it does seem to me that this is a subject which needs and engenders the attention of your Association and in respect to which the methods to be adopted in the future might prove more efficient than those adopted in the past.'

After again expressing his sympathy with the work of the Association, and welcoming the delegates, the Premier closed his address.

The president then called upon Right Hon. Sir Wilfrid Laurier, leader of the Opposition, to address the convention.

Sir Wilfrid opened with a reference to the 1906 Convention and to the sympathy and co-operation he then received from Mr. Borden. He also gave a word of welcome to those present.

'It has taken us a long time to realize,' Sir Wilfrid went on, 'that the forest is one of the greatest assets of our country. Of course, we know that one thousand acres under tillage will support a larger population than one thousand acres covered with forest. But we have commenced to learn also that, unless certain portions of the country are covered with trees, remain under forest, the soil as a whole will not be as productive as it would be otherwise. There are certain portions of the earth's surface in every country, and particularly in Canada, which were designed and intended by nature to remain in forest.'

Sir Wilfrid then referred to the destruction of the forest by the early settlers, and the present awakening to their value. 'In the nature of things everything has an enemy,' he continued, 'but besides these enemies which attack the forest as part of the work of nature, the forest has three enemies of whom I desire to say a word. These three enemies are the settler, the railway and the prospector. I repeat what I have just said that there are certain parts of the country which ought to remain under trees. But the settler cannot always appreciate that. If he sees two hundred acres of land in a small valley which he thinks suitable for tillage, he very often does not care though, by clearing the soil on that two hundred acres, he destroys, perhaps, a hundred thousand acres of timber. I wish your convention would give attention to the suggestion made by my right honorable friend the prime minister a moment

ago when he suggested that there should be a survey of the whole country made to distinguish what is forest land and what is tillable soil. If the Conservation Commission which was appointed some years ago, and which has been doing some splendid work, were to apply itself to making a survey of the whole country, to carefully point out which part should remain in forest and which should be given to the settler, I am sure that the Prime Minister would not hesitate to put an appropriation in the estimates in order to have this map distributed over the whole country so that every man should know what land ought to remain in forest and what could be given over to the settler. I think we are all agreed that the hillsides and all the plateaux which are the sources of rivers should be conserved sacredly in forest, for if these hillsides and plateaux are denuded of their forests, the rivers will suffer and even the climate will be affected . . . Then I would be prepared, for my part, to join in an effort to induce all governments and parliaments and legislatures to have these plateaux for ever reserved, and never have the axe of the settler in them, but only the axe of the lumberman.'

Sir Wilfrid then referred to the railways as the cause of forest fires. While giving them credit for their efforts in this direction, he thought much more could be done.

'The third enemy of whom I have spoken is the prospector,' Sir Wilfrid continued. 'I am afraid he is not always as careful as he ought to be to put out his camp-fire. And this may be particularly true of some who realize that a forest fire uncovers the rocks in which he is seeking the find for which he so eagerly searches. I am told (I have no personal information on the subject) that the terrible fires of last season were largely caused by the prospector.'

With a few words of endorsement of what the Premier had said and of welcome to the delegates Sir Wilfrid resumed his seat.

The president then delivered his annual address. He reviewed the work of the society for the year and the progress of conservation work generally. He advocated the association taking a more aggressive attitude, and suggested three lines along which they should agitate, viz., (1) the taking of the forest services out of politics, (2) a permanent forest policy for Canada, (3) the adoption of efficient means of dealing with slash. He urged the employment of a trained forester by the Association.

A Progressive Forest Policy.

Mr. H. R. MacMillan's paper, entitled 'A Progressive Forest Policy Requires an Investment of Capital', was then read, in the absence of the writer, by Mr. R. H. Campbell, Director of Forestry, who, in reading it, made many valuable comments.



Mr. R. H. Campbell.

Mr. MacMillan drew attention to the fact that the selling of the forest reserves was but the beginning of forestry. Proper administration of these reserves

must follow, and this demanded trained men and money. A properly managed the Riding Mountain forest reserve in Manitoba would produce enough timber to supply the carpentry and joinery of Ottawa and Hull, and yet leave wood for thousands of settlers. Again, the Esquimaux Mountain forest reserve would produce more timber than is now manufactured in the two provinces of Ontario and British Columbia, the two foremost lumber provinces of the Dominion.

Reference of forest management in Europe proved that the financial return for well-managed forests was in direct ratio to the amount spent in protection and management of the same. Examples were quoted in proof of the statement.

The first need for expenditure on the forests was to make them "fireproof." Fires along railways could be prevented by patrol and proper locomotive equipment, and by making the ranges free in these districts. The reserves must be made accessible in all parts for roads, and road communication must be provided for by the use of telephones. These would be supplemented by lookout stations with telephone connections.

Such cutting regulations must be enforced that the forest will not be left a firetrap, and that the trees will stand in naturally. Study must be directed at scientific study must be carried on to determine the proper methods of logging in each district, and experiments must be made in, and study given to, the utilization of sawmill and other waste, the possible extension of the pulp industry and many other questions connected with the utilization of the forests.

Above all the fact must be constantly borne in mind that money subsequently put into forestry will yield good returns in future.

Van Melickum, B. J. Director of Paper Factory, Hudson Bay Company, the charge of Chief of English papers work in Northern Ontario, agreed the Government and in a vigorous speech urged the employment of Indians in the forests. The Indians, he said, had thoughts of none in the world, where the life was open, would do the hard work that a white man would make a good grey-bird in as well as a good fire ranger.

Mr. E. Stewart, Director of Forests and Game, suggested a National Forests Commission, and spoke of his very anxious desire to introduce legislation for the control of this industry.

Mr. R. H. Campbell, Director of Forestry, said of the importance of the subject, and of the necessity of the establishment of the Department of Forestry in the Government of Canada.

Mr. Aubrey White, Deputy Minister of Lands and Forests for Ontario, then spoke briefly. He defended the use of college students as fire rangers, claiming that in dealing with parties of sportsmen and campers a young man of education was more capable than the average woodsman or 'lumber-jack.'

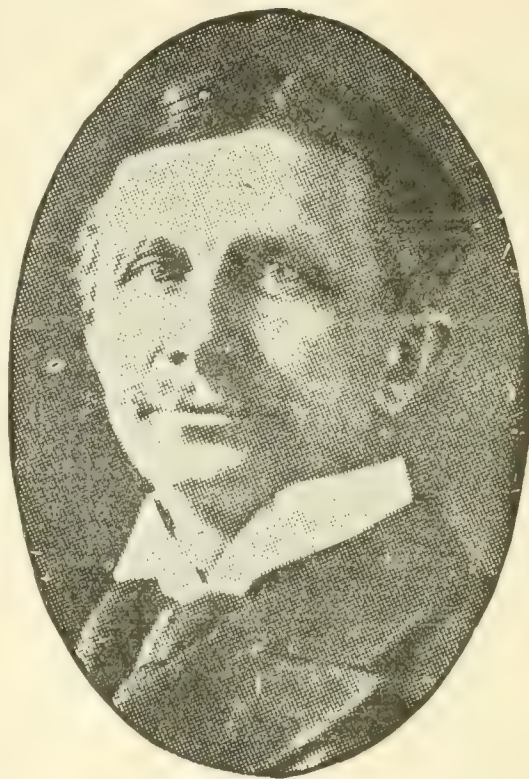
Other speakers of the morning were Rev. Dr. Geo. Bryce of Winnipeg; Lt.-Col. J. W. Harkom, of Melbourne, P.Q.; Mr. A. Knechtel, Inspector Dominion Forest Reserves, and Mr. W. H. Berry, Assistant Deputy Surveyor-General for New Brunswick, St. Stephen, N. B.

Wednesday Afternoon.

Wednesday afternoon's proceedings were opened with the reading by Dr. Fernow of the Report of the Committee on Forest Fire Legislation. This committee was composed of Dr. Fernow, chairman, and Messrs. Thos. Southworth, of Toronto, W. C. J. Hall, of Quebec, P.Q., Ellwood Wilson, of Grandmere, P.Q., Dr. Judson F. Clark, of Vancouver, B.C., Frank Davison, of Bridgewater, N.S., and G. C. Piché, of Quebec, P.Q.

The committee, the report stated, had collected all the existing forest fire legislation in Canada and most of the United States. They also received expressions of opinion from competent persons and upon these they based their report. They found that while the Dominion and all the provincial governments had passed legislation to protect forests from fire, these laws varied greatly in detail and in efficiency. They reviewed the laws of all the provinces, and having taken all things into consideration they stated that the law of Nova Scotia was probably the most efficient for the conditions there. New Brunswick, Quebec and Ontario had laws which were good in many respects, but they were all primarily designed to protect unorganized territory and they needed to be supplemented by provisions looking to the co-operation of county and township authorities in the organized districts with the officers of the province and the rangers of the lumbermen in the unorganized districts. The laws of the prairie provinces were designed in the first place to stop prairie fires and needed to be very considerably supplemented. In British Columbia and the Dominion, fire protection was largely a matter of executive administration.

The committee reported that legislation to be effective must be carried out by a thorough organization backed up by public opinion. Different sections required different laws and the reason the Nova Scotia system was efficient was because all parts of the province were organized territory. Preventive measures were need-



Dr. B. E. Fernow.

ful, and public opinion must be so aroused that persons guilty of causing fires might be properly punished.

The three main causes of forest fires were railways, settlers and persons, like sportsmen and prospectors, passing through the forest. Regarding railways, safety should be sought in improved equipment of locomotives, clearing of the right of way and patrol. In regard to settlers the first suggestion was an educative campaign. Quebec was congratulated in that the clergy under the direction of the bishops read letters of caution from their pulpits. Times should be fixed in which settlers must burn the slash from their clearing operations and in each case a permit to burn the same should be secured from the fire warden of the district. Regarding those whose business takes them into the woods, it was suggested that persons like tourists and prospectors passing through the woods should not be allowed to start fires for any purpose without having a permit from the proper officer. Such permits should be for a short time only and renewable upon good conduct. To reduce the danger from lumbering operations the report recommended the burning of the slash, while the logging operations were going on, or the 'downing' of tops and branches so that they might lie close to the ground and rapid decay. Upon the important question of organisation the committee report that it should be central and permanent, and should at the same time co-operate with municipalities and timber limit holders. The organisation

should have an experienced head with large discretionary powers, and a body of permanent paid rangers. During the danger season this body should be assisted by additional patrolmen. The country should be divided into inspectoral districts and each officer and patrolman must be held responsible for his unit. The equipment of districts at proper points with lookout stations, trails and telephone lines was recommended.

Dr. E. H. Hall, Secretary of the Society for the Protection of the Adirondack, New York, outlined the methods adopted in that region, especially of burning loose motives and the 'lopping' of tops.

Mr. D. B. Rochester, of Ottawa, severely criticized the provincial government in regard to its ranger system, claiming that many of the present appointees were quite useless, and that experienced woodsmen should be appointed.

Mr. Ellwood Wilson said the lumbermen must protect themselves and provide efficient men. The best results were got from sending the men out in pairs, one a student (preferably a forestry student), the other a woodsman. He advocated the lumbermen forming protective associations, but the government must stand back of the licence holders, and prosecute offenders responsible for fires.

Mr. A. MacLaurin, President of the Canadian Lumbermen's Association and a Director of the Canadian Forestry Association, criticized the Association for not having done anything, but was corrected by several members, who pointed to the part the Association had in advising for the regulations under consideration by the Railway Commission.

Mr. N. S. Dunlop spoke in defence of the railways. The C. P. R. spent very large sums in fighting fires, many of which it was not in the least responsible for. For fighting one fire alone they had paid out \$8,000 in wages. Spark arresters in the front of engines, he claimed, were not practicable.

In answer to a question from Dr. Hall he said that not one per cent. of the fires were caused from ashes dropped from the firebox, and in this was corroborated by Lt.-Col. Harkom.

Prof. John Macoun described the organization which he had found on the C. P. R. lines in the Kootenay district for fighting fires along their lines. The people's neglect of fires in the forest was very blameworthy, and often large fires, such as that at Forest, had come from this neglect. Restrictions should be placed on settlers burning brush. That sector should be freed from political control, as long as politicians appoint fire-wreckers, he said, 'there will be fires.'

Hon. Robert Fisher defended the Association against the charge of having done nothing, and reminded them that at Quebec in 1911 the Association had made two main requests, first, that the forest reserve on the east slope of the Montee should be set aside by law, and second, that the railways should be placed under the control of the Railway Commission in regard to the work of dealing with fires. The first had been accomplished, and the Commission had been given power to remove the railway companies and let them remain separate fires. The second was to be held responsible for fires along their lines unless they could show that they had used the best and most modern equipment for the control of fires. The Railway Commission were even then engaged in formulating regulations for the control of fires.

Hon. W. A. Claffan, minister, urged more generous treatment of the fire protective force. Smelling kerosene and the woods to have a picnic in the summer time was the last way to get the woods burned up. 'Get more fire-wreckers. The last men you can get, pay good wages and give them plenty of money,' was his advice. He mentioned the case of a British Columbia lumberman and his neighbours who every spring of his own accord, burned the debris left in the previous winter's logging operations on his lands as a protection against fire risk. 'The loss of timber is offset by the fact that the debris would pay a great army of fire-rangers for a century,' he said.

Mr. J. E. White, Colonel, R. G. Regt. of Woods Operations of the Quebec Paper Co. questioned the figures given as to the cost of burning losses.

Mr. Farnon argued that they were as good figures given by the railways as operations on an open white pine stand in Minnesota.

Mr. C. E. Fyffe, of Kansas, R. V., State Forester, gave figures given and as the cost of lopping tops in a yellow-pine operation. He spoke of the benefits of the lumber industry that had established in his state and claimed the lopping of all its innovations greatly lessened the number of fires.

Mr. Pinchuk also raised the question and during the afternoon session, said that Prof. Macoun had said the danger to the west of fighting fires, namely, 'get some men at the fire as soon as possible.' It was reasonable to secure adequate fire protection as long as men were appointed for political reasons. As to the cost of lopping tops, he knew it had been done in an operation in spruce timber at a cost of \$100,000, and he said that it was a good thing. In sufficient timber it was absolutely necessary to get rid of the tops.

Mr. Wm. Farnon, of Quebec, suggested

his own experience in installing telephones on his limits and the benefit they had been. He thought it would be worth while for the government to bonus lumbermen for building such lines. The fraudulent taking up of lots by so-called settlers must be put a stop to.

On motion of Dr. Fernow, seconded by Mr. Little, it was resolved to accept the committee's report and continue the committee for the purpose of reporting on organization.

The Banquet.

On Wednesday evening a banquet was held in the Parliamentary Restaurant, at which about two hundred guests were present. The chair was occupied by the president of the Association, Mr. Chown, at whose right were seated Rt. Hon. R. L. Borden and Mr. Alex. MacLaurin, president of the Canadian Lumbermen's Association, and on his left Rt. Hon. Sir Wilfrid Laurier and Dr. Gifford Pinchot. Others seated at the head table were Hon. G. E. Foster, Mr. Wm. McNeil, Director of the Canadian Lumbermen's Association, Hon. G. H. Perley, Hon. T. W. Crothers, Hon. Sydney Fisher, Sir Frederick Borden, Hon. F. Oliver, Dr. B. E. Fernow, Hon. J. G. Foster, U. S. Consul, Major R. W. Leonard, Chairman N. T. R. Commission; Dr. Rothrock, of Pennsylvania, Dr. E. H. Hall, of New York, Mr. W. R. Brown, of New Hampshire, Hon. Speaker Sproule, Mr. Haughton Lennox, M.P., Hon. J. A. Matheson, Premier of Prince Edward Island. The vice-chair was occupied (in the unavoidable absence of Senator Edwards) by Mr. H. M. Price, and at his table were seated Messrs. N. Curry, President of the Canadian Manufacturers Association, Geo. Burn, General Manager Bank of Ottawa, Dr. F. C. Harrison, President of Macdonald College, Prof. W. J. Black, president Manitoba Agricultural College, Aubrey White, Deputy Minister of Lands and Forests for Ontario, Jas. White, Secretary Commission of Conservation, Dr. J. W. Robertson, Chairman Commission on Technical Education, Rev. Dr. Geo. Bryce, Member of the Commission on Technical Education, Wm. Little, Wm. Power, M.P., Lt.-Col. Harkom, E. Stewart, R. H. Campbell, Senator Bostock, Wm. Pearce, S. Kydd, of the Montreal Gazette, H. A. Reynolds, Secretary of the Massachusetts Forestry Association, and N. S. Dunlop, of the C. P. R.

The toast to 'The King' was proposed by the chairman, and honored in the usual manner.

The toast to 'The Parliament of Canada' was proposed by Hon. Sydney Fisher, who, in opening, congratulated the present parliament on having brought down a larger appropriation for forestry than had ever been provided before. He enlarged upon

the importance of the reserve made of the eastern slope of the Rocky Mountains, and commended to the parliament of Canada the figures given that morning by Mr. Campbell, Director of Forestry.

Rt. Hon. R. L. Borden was the first to reply. In opening he made appreciative reference to Hon. Mr. Fisher's faithful work as Minister of Agriculture. Mr. Borden referred again to his expression of the morning, that conservation consisted in the wise and prudent utilization of the country's natural resources, having regard to the fact that they were the property, not alone of those living to-day, but also of both those who had passed away and those who were to come.

After a brief complimentary reference to Dr. Pinchot, Mr. Borden expressed his gratification in realizing that Canada had started the work of conservation earlier in her national history than had the United States. The work was only beginning, as was shown by the difficulty experienced in obtaining reliable information in regard to the natural resources both of Canada and the United States. He suggested that Canada should immediately begin a stock-taking of her great natural resources.

Sir Wilfrid Laurier, after some humorous references to the changed positions in Parliament of himself and Mr. Borden, referred to the unanimity shown by both parties in putting through the bill creating the Commission of Conservation. The idea of the commission had come to them from their neighbors of the United States, and, among them, Dr. Pinchot had been foremost in pressing the idea. He was welcome with them on that occasion, and would be welcome if he decided to live permanently in Canada. Sir Wilfrid paid a high tribute to the chairman of Canada's Commission, Hon. Clifford Sifton. He (Sir Wilfrid) hoped the Forestry Association would become a permanent institution. No life was more pleasant, he thought, than that of the lumberman.

Mr. H. M. Price proposed the toast of 'Our Guests'. He referred especially to Dr. Pinchot, and alluded to a passage from Mr. O. W. Price's book, 'The Land We Live In', to the effect that the natural resources of the country were resources in which a man's children were even more interested than he himself. He advocated the prosecution of forestry instruction among the boys and girls of Canada.

Dr. Pinchot, in reply to the toast, after thanking the convention for their compliment, gave an inspiring speech, clearly showing how forestry had branched out into the conservation movement, and that again into an alliance with the forces fighting against child labor, unfair conditions of work in factories, poisonous foods and many other abuses. Forestry began

with trying to make the best use of the forests, both for the present and the future, for the welfare of the nation. The conservation movement simply included in this formula, along with the forests, the nation's other resources. Dr. Pinchot gave instances of woodlands and other lands fraudulently appropriated by private concerns in the United States. They found they had to ask two questions: not only 'Shall the resources continue to exist?' but also 'For whose benefit shall these resources be used?' Then they struck the question of monopoly, and found themselves allied with some of the forces mentioned, with whom they at first seemed to have no relation. 'There we came to a question which at first sight is not related to conservation at all, the question of monopoly, because we had discovered, when we came to work at these matters, that every monopoly of every kind, when you follow it down to its source, is based somewhere on the control of a natural resource or a natural condition.' The moment they began to act in conservation they found themselves confronted by the political power of some particular interest to whose advantage it was to prevent the active execution of the conservation policy, or, in other words, by monopoly maintained through politics by a few men for their private advantage. It was at this point that they saw their common interest with the other forces. The whole question of conservation could be reduced to the elimination of waste, not only of waste of forests, but of waste of the nation's property when a water-power was grabbed by a special interest, of waste through strikes and lock-outs, of waste of human life and all that goes to make life worth living. All these were waste to the nation, waste of the power to make the nation better.

Hon. Geo. E. Foster then proposed the toast to 'The Lumberman'. In speaking he expressed his appreciation of the conservation principles as laid down by Dr. Pinchot. The bonds of conservation, he thought, were not simply national, but world-wide. Turning then to the lumbermen themselves, he thought the day of the 'predatory' lumberman, who looked on the forest as something to be got rid of the way, was practically passed, and that he was giving way to the lumberman of foresight. While the present generation had a right to the use of the nation's present resources, they had no right to devastate or destroy. The 'predatory' lumberman should be disciplined by his fellow lumbermen and by the governments. In closing Mr. Foster outlined the idea of more education of the boys and girls of today along the lines of conservation.

Mr. Alex. MacLaurin, after thanking the convention for the toast, on behalf of

the lumbermen, quoted these sentences in having the Quebec forest conserve act made by act of the legislature:

Mr. Wm. McNeil also responded on the lumbermen's behalf. He drew the attention of the audience to the legislation at the moment before the British Columbia government, putting into statute form their policy of forest preservation and conservation. Mr. O. W. Fries, an associate of Dr. Pinchot's, was greatly commending forester, and they were also to know the thought of Mr. Pinchot's advice. Special provision was being made in the act for the protection.

Dr. B. L. Fernow then briefly proposed the toast of 'The Forest Service', in a brief and witty speech, in the course of which he compared the forester to a phagocyte, the forester being called to correct bad conditions in a lumbering business as a phagocyte corrects bad conditions in the blood.

Mr. E. H. Campbell, in responding, pointed out the fact that Canada's supply of hardwoods had been depleted to such an extent that those woods had now to be imported from the United States, and that the white pine, inside of fifty years, would become a curiosity in Canada. The time had come when Canada must make a special study of her forests and must have trained men to make this study, study not only of special instances, but of general conditions, so that a proper basis could be formulated on which their policies and plans could be founded. The general public, too, must be educated so as to get to know and sympathize with the efforts of the forest service. Canada was democratic and would tolerate democracy, and the people must be educated to know the future.

Mr. Arthur White also responded to the toast. He congratulated the Association on the success it had achieved in creating and holding public opinion. He described the conditions in the province of Ontario and showed what steps were being taken by the government to conserve the resources of the province. He referred to his own experience in attending the American Conference at Washington in 1911, and the influence of the American foresters in advancing the conservation idea.

Mr. Frederick Boring then briefly proposed the toast to 'The Lumberman'. He expressed the pleasure in being with Dr. Pinchot, and in knowing that the people, as a whole, were taking great interest in conservation questions, and that the concept of light conservation was being

Mr. Nathaniel Fries, called for the toast to the conservation movement. He expressed his pleasure in being with the conservation movement, and in knowing that the people, as a whole, were taking great interest in conservation questions, and that the concept of light conservation was being

their cars, were forced to go to the southern states for most of it, and also send a man to follow the order up. He thought the forestry movement should have been started years ago, and criticized the government in regard to its attitude to forest fires, especially along the line of the Intercolonial railway. His efforts to get the Intercolonial to assist in the protection of his lands from fire had been without result, and as a result they had burned up about half of his timber. In the Maritime Provinces the railways were the most destructive agency, then the fishermen and then the settlers clearing land. He had himself ordered trees from Germany and was about to try reforestation work.

Mr. N. S. Dunlop replied on behalf of the railways. He believed the C. P. R. would co-operate in any measures that would tend to keep down the fires along the railways. He had been himself trying to instil ideas of conservation into the employees of the C. P. R.

The singing of the National Anthem then closed the banquet.

Thursday Morning.

The session of Thursday opened at ten o'clock.

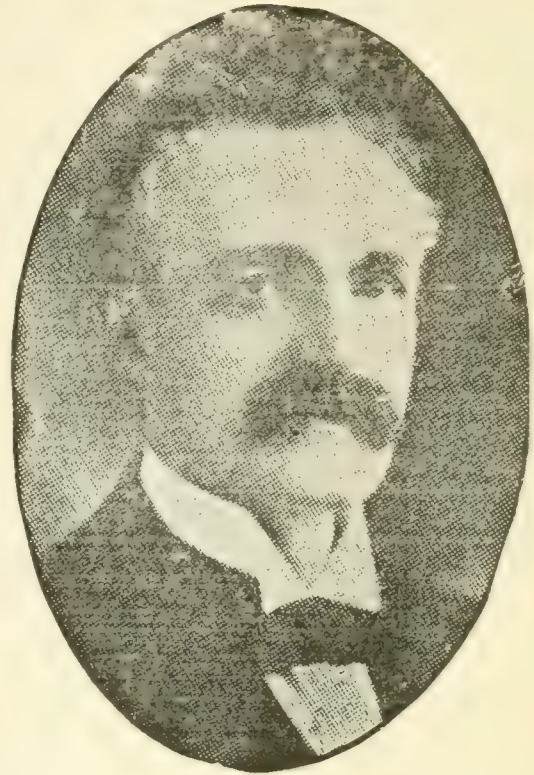
Mr. N. M. Ross, Chief of the Tree Planting Division of the Forestry Branch, opened the program with a short account of the work done by the Forestry Branch in the free distribution of trees to the farmers on the prairies. He explained the regulations and touched on the results of the distribution. He favored the establishment of a Dominion laboratory especially with a view to the conducting experiments in wood preservation.

Mr. R. D. Prettie, Chief Forestry Inspector for the C. P. R., touched on the question of the work being done by the C. P. R., especially at the timber preservation plant connected with that corporation.

Dr. C. Gordon Hewitt outlined the work being carried on by the Department of Entomology of the Central Experimental Farm, with special reference to the Larch Sawfly and the Spruce Budworm.

Mr. Gifford Pinchot's Address.

Dr. Pinchot was received with hearty applause. In the commencement of his address he referred briefly to the anomalous position which the U. S. Forest Service occupied before 1905, when the forests were all administered by the Department of the Interior, while the foresters were all in the Department of Agriculture. Prior to the change political influence had played a considerable part in appointments to the executive force controlling forests.



Mr. Gifford Pinchot.

The first mistake they had thus made was to allow political considerations to enter into appointments. Under President Roosevelt, however, entrance to the Forest Service was made subject to passing an examination.

The first principle on which a successful forest service must be based was that of absolute freedom from political control in the making of appointments—a point he had been glad to hear the Premier favor on the preceding evening.

The second principle to be followed in forming an efficient service was that the men must be trained. The most practical men in the end were those who came into the service with scientific training and then got the practical experience.

The third principle was that the administration of the forest must be given enough money. Even yet the U. S. Forest Service had not obtained an appropriation sufficiently large to carry out necessary work.

In the United States they had to meet a demand for the surrender to the states in the west of not only the forests, but also the water-powers within their boundaries. Men with offices in New York and Chicago were especially anxious that the natural resources of states such as Nevada, Oregon and Colorado should be turned over to state control. From the conservationist standpoint federal control was preferable because the smaller legislatures were more easily controlled by the special interests. 'Federal control of national resources

seems to me to be absolutely essential in the work you are undertaking."

In organizing a forest fire protection must be the first aim of all, and the great thing was to make the forest accessible with trails, telephone lines and other means of communication. The fundamental principles on which an efficient forest force was to be built up were thus four in number: (1) No politics; (2) Trained men; (3) Enough money; (4) Federal control.

In the organization of such a force the line of responsibility from man to man must be absolutely clear, and each man must know the extent of his responsibility.

Young men could successfully bear three or four times as much responsibility as one would expect of them.

Then the man must be 'given his head.' An organization where a man simply worked under orders, not even signing the letters he wrote, might ruin the man for high-class executive work. An organization built on democratic lines such as indicated would get twice as much work from men as the more rigid one, and could do field work that could not be done at all along other lines.

Local interests must be given a chance in handling their own forests, in some such way as the Grazing Advisory Boards assisted in the Western States. They must understand, too, that the forests are being handled in their interests. In this way local sympathy is gained.

Delay in dealing with matters of administration must also be avoided.

Antagonism between office and field force must be prevented. As much work as possible must be taken from the office and given to the field men. The U. S. Forest Service exists, not for the office end, but for the field end. In the U. S. Forest Service men were frequently given a change from the one class of work to the other. 'We have a definite order that the recommendation of the field man must not be turned down unless affirmative reasons be given. You absolutely must have the field man know that the man in the office is ready to stand behind him, even to the extent of losing his job.'

A forest service, to be efficient, must combine research work with its executive work. 'The reason the (U. S.) Forest Service exists today in the face of many attacks from its enemies is that it succeeded in building up a public sentiment so strong that the men who wanted to destroy the service could not fight that sentiment.' Publicity was absolutely essential, and it should be a regular part of the daily duty of the service to let the public know what is going on.

Hon. Arthur Duffell, Dominion Minister of Agriculture, expressed his pleasure in hearing Mr. Duffell's speech. He referred to the important job entrusted to his own province, British Columbia, by forest fires, and expressed his appreciation of the great value of the preservation of the forests of the province for the sake of the water-garments, and in the dry belt, for irrigation.

Mr. E. H. Campbell mentioned as the loyalty of the staff of the United States Forest Service and expressed his confidence that Canada could hold up as good a service. He emphasized the value of the trained men, such as the Faculty of Forestry of the University of Toronto was turning out, because of their great value. A much larger appropriation than the one now given to Dominion lands in Canada (less than one-half per cent) was urgently heeded.

Mr. E. Stewart agreed with Mr. Flinders that young men employed in forestry should have enough responsibility to keep them interested.

Mr. F. A. Sterling, President of the Pennsylvania Railroad, then gave his paper on 'The Attitude of the Railway toward Forest Fires,' a synopsis of which is as follows:

Although conditions over-estimated, the number of fires caused by railway locomotives is large, therefore the attitude of the railway toward fires and the possibilities of reducing this source of danger are important. While the issue is very real,



Mr. F. A. Sterling.

ways showed little interest in this subject they in this erred in common with all other interests from the governments down to the woodlot owner.

Practically all accomplishments in forestry in the United States and Canada have taken place in ten years and the most important within the last five years. Our forests are still far from safe, but governments and individuals are now active, and another ten years should remove the fire menace.

There are various reasons why railways have been too frequently the cause of forest fires. No spark arrester has yet been designed which will check all sparks and yet give the locomotive free draft. Logically all inflammable material should be removed from the right of way, but this is very difficult, especially in new railways through forests. The right of way is too narrow for a safe fire belt even if cleared to mineral soil.

There is no reason for the belief that railways deliberately permit fires to start. They are the heaviest losers when forests burn. They lose freight, and tourist travel, and are besieged with damage claims. Under the impetus of the conservation movement in the United States, the federal and state governments, the timber owners and railways are now co-operating to reduce this loss.

The most effective methods are the removal of debris from the right of way, regular patrol, systematic reporting of fires by train crews, trackmen, etc., the use of oilburning locomotives, the keeping of ash-pans and spark-arresters in good condition. The clearing of land adjacent to the right of way with a fire guard on each side 200 feet from the tracks has been very successful.

During 1911 only one fire was reported as having been caused by the Pennsylvania Railroad Company, and this was found to have occurred beyond the range of sparks.

Mr. Sterling closed by quoting the resolutions of the Forest Fire Conference held in Portland, Oregon, in December, 1911. These recommended that all debris be cleared from rights of way, a track patrol both night and day during dry seasons; increasing of efficiency of spark arresters and the use of oil-burning locomotives in forest districts where practicable; that no ashes be dumped from trains in motion; that the furnishing of men from section crews to fight fires be expedited; that fires be reported by train crews at the first station passed; that there be co-operation between governments and railways both in preventing and fighting fires, and also in securing data as to conditions and as to best methods of meeting the problem in each locality.

Prof. John Macoun suggested the use of

brine as a preservative for wood, and Mr. Sterling observed that one United States railway company had some thousands of ties in pickle in Great Salt Lake.

Mr. G. C. Piché, Chief Forestry Engineer of the Quebec Department of Lands and Forests, then spoke briefly. He began by expressing the regret of Hon. J. Allard, Minister of Lands and Forests of Quebec, at his inability to be present at the convention. Mr. Piché then touched on different lines on which the province was making progress in forestry matters. In their province the re-organization of the forest service had been followed by the establishment of a forest school, and they were now going on to further measures. One of these was a combined forest and water-power service. Progress had been made in the creation of township forest reserves, which now numbered eleven, with a total area of 120,000 acres, and which they hoped soon to extend. Reforestation was also engaging their attention and next spring they hoped to start that work at Lachute and possibly at Berthier. Reduction of waste in methods of lumbering was also engaging their attention.

Mr. Ellwood Wilson urged the need for the establishment of a school for forest rangers, which would, in the course of a few weeks, give pupils some elementary notion of forestry along with matters involved in their daily routine, such as the management of canoes, etc.

Mayor Hopewell, of Ottawa, and Mr. R. D. Prettie, of the C. P. R. forestry department, were also to have spoken, but were detained.

The session adjourned at 12.30 p.m.

Thursday Afternoon.

The first business taken up at Thursday afternoon's session was the report of the nominating committee, which recommended the following as office-holders for the year 1910-11:—

Patron—H.R.H. the Governor General.

Honorary President—Rt. Hon. R. L. Borden.

Honorary Past President—Rt. Hon. Sir Wilfrid Laurier.

President—John Hendry, Esq., Vancouver.

Vice-President—Hon. W. A. Charlton, Toronto.

Territorial Vice-Presidents.

Ont.—Hon. W. H. Hearst.

Que.—Hon. Jules Allard.

N.B.—Hon. J. K. Flemming.

N.S.—Hon. G. H. Murray.

Man.—Hon. R. P. Roblin.

Alberta.—Hon. A. Matheson.

Sask.—His Honor G. W. Brown.

Alta.—Hon. A. L. Sifton.

B.C.—Hon. W. R. Ross.

Yukon—Geo. Black, Commissioner.

Macdonald—W. D. Wilson.

Keewatin—His Honor D. C. Cameron.

Unkava—His Grace, Mgr. Bruchesi, Archbishop of Montreal.

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Asst. Secretary—F. W. H. Jackson.

On motion of Mr. Aubrey White, convenor, seconded by Lt. Col. Hartson, the report was adopted and the above declared duly elected.

The Resolutions Committee then presented the following resolutions:

Resolved, that this Association re-affirms its attitude in favor of the inspection of the public domain and the inclusion in forest reserves of lands unsuited for agriculture or where the forests are required for the protection of the waterfalls, and urge on the federal and provincial governments that such a policy be carried out at the earliest possible date; and that when such reservations are created they should be made of a permanent nature by Act of Parliament and adequate provision should be made for a progressive administration on permanent lines.

Resolved, that this Convention has noted with pleasure that the Parliament of the Dominion has during the past year enacted legislation which provides for a law passed along lines of railway, under regulations to be formulated by the Board of Railway Commissioners, and also an amendment rendering Railway Companies liable for damage to any property, including timber, that may be destroyed through the agency of rail companies.

Whereas, efficiency in the administration of the forests of Canada, which are one of the greatest of the national assets, can be obtained only by adopting a permanent policy carried out by a staff appointed on the grounds of special merit

for the positions which they are to fill, and removable only on grounds of inefficiency.

Therefore, Resolved, that this Association urge on the Federal and provincial governments the necessity for providing a system of examinations to test the qualifications of applicants and of making appointments permanent during good behavior, and that in the case of the Federal government for this purpose appointments should be placed in the hands of the Civil Service Commission.

Whereas, the history of forest management in countries where it has been widely developed demonstrates that the profits to the state from the forest are directly proportional to the expenditure for efficient management.

And, whereas, the expenditure on forest management in Canada is on the average less than one cent per acre of the forest lands, while the average in other countries ranges from five cents per acre in the United States to six cents per acre in India, nine cents per acre in France, and \$1.00 per acre in Germany, such efficiency of administration will require a much larger expenditure than is at being made in Canada.

Therefore, Resolved, that the Canadian Forestry Association in convention assembled urge upon the Federal government and the governments of the provinces the necessity for providing larger appropriations so as to secure efficiency of management and increasing profitability from the forests of Canada.

Resolved, that this Association have full satisfaction the passage of an Act by the Legislature of the Province of Ontario empowering municipalities to take up waste lands for the purpose of reforestation, and express the hope that the policy of waste land planting in the other provinces be further developed and placed on a practical basis.

Resolved, that this Association express regret the government the necessity of limiting, suspending, and withdrawing its cooperation with the Forestry Branch an important national laboratory for testing and developing the growing and mechanical properties of Canadian trees, and that in extending the possibilities of tree use by experimenting with the preservation of wood of various species, and by a view to making possible the use of non-fireable Canadian woods. For perpetuating of the manufacture of good pulp and paper from the best Canadian Canadian woods and the forest products of wood waste which might be made available for pulp and other uses. Thereby.

Resolved, that this Association approve the proposal of reporting to large quantities Christmas Trees of spruce and balsam.

and recommends legislation to prevent such practice.

Resolved, that the Canadian Forestry Association, in convention assembled, wishes to place on record its deep sense of the loss which has been sustained by the Association and the cause of forestry in general by the untimely death of the late E. G. Joly de Lotbiniere, a past president of the Association, and who, following in the footsteps of his distinguished father, was one of the most active and faithful advocates of forest protection in Canada and a strong and earnest supporter of the work of this Association. The services of the late Mr. Joly de Lotbiniere to forest conservation cannot be overestimated. By voice and pen and by the publication of his own practical studies in the forests he did important work in the campaign of public education, and his enthusiasm and kindly help were a great incentive and support to those who had the pleasure of working with him in the great cause which he had so much at heart, and his passing from our midst leaves a keen feeling of personal loss. To his widow and family we wish to convey our heartfelt sympathy with them in their bereavement,

And that the Secretary be instructed to transmit a copy of this resolution to the family of the late Mr. Joly de Lotbiniere.

Resolved, that the thanks of this Association be tendered to those who assisted in making the convention a success, and particularly to the Rt. Hon. R. L. Borden, Rt. Hon. Sir W. Laurier and Mr. Gifford Pinchot.

Resolved, that the Canadian Forestry Association desires most respectfully to convey its thanks to His Royal Highness, the Duke of Connaught, for the gracious extension of his patronage to the Association.

Resolved, that the thanks of the Canadian Forestry Association be tendered the Dominion Government for its continued assistance to the Association in the grant of \$2,000 per year; also to the Government of Ontario for its grant of \$300 to the Governments of Quebec and British Columbia for their grants of \$200 each, and to the Government of New Brunswick for its grant of \$100; and that the Secretary be instructed to endeavor to secure a grant from the other timber owning provinces of the Dominion.

Resolved, that the thanks of the Canadian Forestry Association be conveyed to the General Managers of the Bank of Montreal, Bank of Commerce, Merchants Bank, Molsons Bank, Bank of British North America, Imperial Bank, Royal Bank, Traders Bank, Quebec Bank, Bank of New Brunswick and Bank of Hamilton, for their continued assistance by making their Branch Managers, or such of them as reside in lumber districts, members of this Asso-

ciation. This assistance is not confined to the amount received, important as that is, but it also introduces the subject of Forestry into communities where it would not otherwise have a footing. The Secretary is instructed to bring this matter before other Banks, particularly those largely interested in timber districts, that this plan may be further extended.

Resolved, that the thanks of the Canadian Forestry Association be tendered to the railways of Canada for their kindness in granting special rates to the convention.

Resolved, that the thanks of the Canadian Forestry Association be tendered to the Press of Canada for its continued support of forest propaganda in publishing extracts from the bulletins and other literature sent out, and in giving prominence to the meetings of the Association.

Resolved, that the Association desires to express its appreciation of the faithful and efficient work of the Secretary and staff of the Association.

Resolved, that, in accordance with the notice duly given, Clause VII of the Constitution be changed to read as follows:—VII. The annual meeting of the Association shall be held during the month of February in the City of Ottawa, unless otherwise determined by the Executive Committee of the Association, and a notice of one month of the date selected shall be given to each member by the Secretary.

Resolved, that the members of the Committee on Forest Fire Legislation be thanked for their report, that the report be adopted, and that the Committee be continued and requested to work out a scheme of organization.

Resolved, that the minutes of the last meeting, having already been printed and published in the Association publications, be taken as read.

Resolved, that the report of the Treasurer, as audited, be received and adopted, and that the accounts therein are hereby ordered to be paid.

Resolved, that the Auditors, Messrs. Hawkins and Clendinnen, be paid the sum of \$10 each and thanked for their services, and requested to act for the year 1912.

Resolved, that an honorarium of \$100 be paid to the Treasurer for her services.

It was then moved by Lt.-Col. Harkom, seconded by Mr. Stewart, that the thanks of the Association be tendered to our retiring President for the able manner in which he has conducted its affairs during his term of office.

This was passed by a standing vote. The retiring President thanked the members for their kind resolution, but said that anything he had done had indeed been a labor of love.

Mr. E. Stewart then read his paper on 'The Aims and Objects of the Canadian Forestry Association.'

Mr. Stewart pointed out the objects for which the Association had been formed. It was intended to be, first, educational, and, second, advisory. No administrative work had been contemplated, and, if the association had engaged in controversial topics, it would have impaired its influence. Its strength lay largely in the fact that it was entirely non-political.

The Association's first aim was to arouse public interest in forestry. One result was seen in the fact that opposition to forestry appropriations had died away. By conventions and literature much interest in forestry had been awakened in the public mind and the public of Canada had much need of awakening to the problems of forestry. The Association had done much good and advanced forestry interests by its recommendations to the various governments. One point in which the Association might still do much good work was in inducing the Dominion government to distribute in other countries fuller information regarding the different species of Canadian woods and their qualities. The Association had been particularly fortunate in its Patrons. Another respect in which much success had been attained was in securing the co-operation of the lumbermen.

Mr. Chown wanted more progressive measures, and thought the Association should consider the employment of a trained forester.

Lt.-Col. Harkom agreed with Mr. Stewart, that the Association should be only advisory, not executive.

Mr. J. A. Gripton, of Toronto, suggested the formation of commercial museums and bureaus of information.

Dr. C. D. Howe, of the Faculty of Forestry, University of Toronto, urged the need of further educational propaganda, especially in the lower grades of public schools.

Dr. A. Blue then read a short paper on 'Maple Sugar as a By-product of the Forest'.

The convention then adjourned.

LETTERS OF REGRET

Following are extracts from some of the letters of regret:

John Hendry, Vice-President Canadian Forestry Association, Vancouver, B.C., writes in English:—"I am leaving London on Tuesday next for about five or six weeks, but have left instructions for my mail to be

forwarded to me. I am very sorry I cannot attend the joint meeting and especially, but I hope the meeting will be successful and the success of the meeting."

Sir Edmund Walker, President The Canadian Bank of Commerce, Toronto:—"I have your letter of 17th instant, and I regret exceedingly that I have engagements which render it impossible for me to be present at the meetings of the Canadian Forestry Association on the 24th and 25th January. I have been, however, President for many years of the Merchants' Club, and its annual concerts are held in the week which includes the dates referred to."

Hon. Clifford Wilson, Chairman Canadian Association of Forestry, Ottawa:—"I very much regret that I shall be compelled to be absent from Ottawa at the time mentioned, being called away by important engagements. It is a matter of great regret to me that I cannot participate in the proceedings of your convention, and be present at the banquet. I trust that the efforts which your Association has been making in past years will be continued with unflinching vigor in the future, and that the splendid results which you usually see will be multiplied as time goes on. With best wishes to the President, Directors and Members at the Association."

Hon. S. Ogden, United States Forest, Washington, D.C.:—"I am exceedingly sorry to have to advise you that it is necessary for me to leave for the Pacific coast at the end of this week to attend a series of important meetings of Forest officers, which will preclude the possibility of my returning in time to attend your convention in February. I am particularly sorry to have to send you this unfavorable news as I appreciate the welcome in the Dominion and should like to see in every way I can."

Hon. Mr. James E. H. Macdonald, Chief of Appeal, Ontario:—"The fact that the Association has collection of a good lot, with high specimens of many kinds, and so on about trees and so I am very glad, the good will and best wishes of everyone. I have been and with the best of the natural forests of the province have been of considerable help and value to a good number of people and many of them, as well as my own has been given in a number of instances, as well as assistance in many ways, and I am very glad to see the interest and better things in them to make my life and so on in every way I can."

Most Rev. R. T. Matheson, M.D., Archbishop of Rupert's Land and Primate of the Anglican Church in Canada, Moderator of the University of Manitoba, Winnipeg:—"I am very glad of the Canadian Forestry Association to see me in your beautiful hall and also in the same meeting."

would give me the very greatest interest and pleasure to attend both, but I fear that I cannot get away at this season of the year. The preservation of our Canadian forests and the spreading of trees on our prairies commend themselves to me very strongly indeed. In fact, some of my farmer friends in the country think that I am a crank on the subject. I am always exhorting them about the matter. I shall be interested in hearing of the results of the meeting. Kindly convey to the Association my regret at not being able to be present."

J. S. Willison, Esq., Editor-in-Chief *The News*, Toronto.—"It will be quite impossible for me to leave Toronto during next week. I should like to attend the sessions of the Association, and can only hope that at some future time I may have the privilege of doing so."

J. S. Brierly, Esq., President The Herald Company, Montreal.—"I regret very much to say that pressing business engagements will prevent my being present, as I appreciate very much the work your Association is doing for Canada, and I would like very much to have the opportunity of testifying to that appreciation by being with you on Feb. 7."

Sir William Whyte, Vice-President Canadian Pacific Railway, Winnipeg.—"I expect to be in the South at that time, therefore will be unable to be present. I regret this very much, as I should like to listen to the able addresses that will, no doubt, be delivered on the occasion. I consider the question of reforestation of very great importance to the Dominion at large. If the demolition of our forests is permitted to go on, without any effort being made towards reforestation, the streams will cease to flow and a deal of the land that is now productive will become semi-arid. I sincerely hope that the addresses delivered at the banquet will be the means of causing the Federal Government, also the provincial governments to take immediate action towards introducing and putting into operation a proper system of reforestation."

David McNicoll, Vice-President Canadian Pacific Railway, Montreal.—"There is a somewhat prevalent opinion that the railways are forest destroyers, but that is really very far from the truth. We have spent enormous sums of money in clearing our line and we watch the whole subject very closely, and I am satisfied if we could get those owning the land adjacent to ours to give the question a little attention, we would hear less of fires."

Hon. W. C. Grimmer, Attorney General of New Brunswick.—"I do not intend to cease my efforts in connection with forestry though I have given up charge of the Crown Lands in the Province of New Brunswick, but

will endeavor to keep in touch with this industry and with our Crown Lands in a very intimate degree."

Note.—Hon. Mr. Grimmer has recently exchanged the portfolio of Surveyor General for that of Attorney General.

UNABLE TO BE PRESENT.

Among those who sent letters of regret were the following:—

- Allard, Hon. J., Minister of Lands and Forests, Quebec.
- Atkinson, J. E., Editor *Star*, Toronto.
- Baker, J. Fred., M.F., Professor of Forestry, Michigan Agricultural College, East Lansing, Mich.
- Balfour, C. H., General Manager Union Bank of Canada, Quebec.
- Bass, Hon. Robert P., Governor of New Hampshire, President of American Forestry Association.
- Bourassa, Henri, M.P.P., Montreal.
- Clouston, Sir Edward, Vice-President Bank of Montreal.
- Cochrane, Hon. F., Minister of Railways, Canada.
- Conklin, Hon. R. S., Commissioner of Forestry for Pennsylvania.
- Creelman, Dr. G. C., President Ontario Agricultural College, Guelph.
- Doherty, Hon. C. J., Minister of Justice, Canada.
- Dougall, J. R., Editor *Witness*, Montreal.
- Edwards, Hon. W. C., Ottawa.
- Elliott, H. G., Gen. Passenger Agent, Grand Trunk Ry.
- Elliott, James, General Manager Molsons Bank, Montreal.
- Falconer, Dr. R. A., President University of Toronto.
- Flemming, Hon. J. K., Premier of New Brunswick, Fredericton.
- Gordon, Rev. Dr., Prin. of Queen's University.
- Gosselin, Rev. A. E., Rector, Laval University, Quebec.
- Graham, Sir Hugh, Montreal.
- Graves, H. S., United States Forester, Washington, D.C.
- Grimmer, Hon. W. C. H., Attorney General, Fredericton, New Brunswick.
- Hanna, D. B., Third Vice-President Canadian Northern Railway, Toronto.
- Hazen, Hon. J. D., Minister of Marine, Canada.
- Hearst, Hon. W. H., Minister of Lands, Forests and Mines, Ontario.
- Hebden, E. T., General Manager Merchants' Bank, Montreal, Que.
- Hirst, E. C., State Forester, New Hampshire.
- Hughes, Col. the Hon. S., Minister of Militia, Canada.
- Kemp, Hon. A. E., Ottawa.
- Lindquist, E., Acting Swedish Consul for Canada, Montreal.
- Lougheed, Hon. J. A., Ottawa.
- Macdonald, Dr. J. A., Editor *The Globe*, Toronto.
- Mackay, J. F., General Manager *The Globe*, Member of Commission of Conservation, Toronto.
- Mackinnon, James, General Manager, Eastern Townships Bank, Sherbrooke, Que.
- McNicoll, David, Vice-President Canadian Pacific Railway.
- Monk, Hon. F. D., Minister of Public Works, Canada.
- Motherwell, Hon. W. R., Minister of Agriculture for Saskatchewan.
- Murray, Hon. G. H., Premier of Nova Scotia.
- Nantel, Hon. W. B., Minister of Inland Revenue, Canada.
- Pease, E. L., General Manager Royal Bank, Montreal.
- Pelletier, Hon. L. P., Postmaster General, Canada.
- Peterson, Dr. W., President of McGill University.

Read, Hon. J. D. Minister of Commerce, Canada.
Rhodes, J. E. Secy. *Wegman's Lumber Co.*,
St. Paul, Minn.
Ridlin, Hon. R. P., President of Maritime Provinces.
Roche, Hon. W. J., Secretary of State, Canada.
Rogers, Hon. Robert, Minister of the Interior,
Canada.
Roosevelt, Hon. Theodore, New York City.
Ross, P. D., Editor *The Journal*, Ottawa.
Ross, Hon. W. R., Minister of Lands, British
Columbia, Victoria, B.C.
Roth, Dr. Elliott, Professor of Forestry, University of Michigan.
Rowley, W. H., President L. B. Lumber Co.
Roy, Rev. Dr. A. B., Keele University of Ottawa.
Rupert's Land, Archbishop of and Primate of
Anglican Church in Canada, (Dry, Matheson).
Shaw, G. H., General Traffic Manager, Canadian
Northern Railway, Toronto.
Sifton, Hon. Arthur D., Minister of Agriculture.
Sifton, Hon. Clifford, Chairman, Commission of
Conservation.
Smith, E. Norman, Editor *Free Press*, Ottawa.
Snowball, W. B., Past Pres. Canadian Forestry
Assn., Chatham, N.B.
Southam, W. M., Editor *The Citizen*, Ottawa.
Southworth, Thomas, Vice Pres. DeLorge Mining &
Reduction Co., ex-Superintendent of Forestry
and Colonization for Ontario, Toronto, Past
President Canadian Forestry Association.
Stevenson, B. B., General Manager, Quebec Bank,
Quebec.
Stikeman, H., General Manager, Bank of British
North America, Montreal.
Strathy, Stuart, General Manager, Traders' Bank,
Toronto.
Tarte, L. J., President *La Patrie*, Montreal.
Tanner, Prof. J. W., Director Yale University
Forest School.
Turnbull, J., General Manager, Bank of Hamilton,
Hamilton.
Wainwright, Wm., Vice-President Grand Trunk
Railway.
Walker, Sir Edmund, President Canadian Bank
of Commerce, Toronto.
White, Hon. W. T., Minister of Finance.
Whitman, F. C., Lumberman and Director C.F.A.,
Annapolis Royal, N.S.
Wilde, D. R., General Manager Imperial Bank of
Canada.
Willson, J. S., Editor in Chief *The News*, Toronto.
Wright, Sir William, Vice-President Canadian Pacific
Railway.

NAMES OF THOSE PRESENT

Explanation of terms: F.E., Forest Engineer; M.F., Master of Forestry; M.S.F., Master's degree of Forestry; B.S.F., Bachelor's degree of Forestry.

Allen, Stephen A. 416 Mulholland av., Ottawa.
 Airest, H., Fort William, Ont.
 Alexander, H. 175 Main St. Ottawa.
 Alford, Walter, Belleville, Ont.
 Allen, Gilbert, Equine Lumber Co., Ottawa.
 Allen, J. B. Robert Gray & Co. Ottawa.
 American Lithographic Company, representative of
 (Albert Cone).
 Am. Dr. H. M. Chaslog, 445 Kansas Ave. E.
 Ottawa.
 Anderson, May, E. A. 19 Fairmount ave., Ottawa.
 Anderson, Frederick, 800 Main St. Ottawa. (Canadian
 Bank of Commerce, Toronto, Ont.)
 Austin, W. J. 2225, Mountain Road, Montreal.
 Ontario Automobile Company, 1000
 Avenue R. 10, Albert St. Ottawa, Ont.
 Armstrong, L. O. Commercial Bldg. 175 Main, Toron-
 to, Ont.
 Bailey, W. E. 101 St. John St., Ottawa.
 Bayl, H. O. 7 St. James, Ottawa, Ont.

- Campbell, R. H., Director of Forestry, Dept. of Interior, Ottawa.
- Campbell, Roy L., Toronto University, Faculty of Forestry.
- Cane, J. G., (J. G. Cane & Co.), Toronto.
- Carr, W. N., Woodstock, N.B.
- Carroll, W. F., 210 Slater St., Ottawa.
- Carufel, L. E., 82 St. Antoine St., Montreal.
- Cassels, Hon. W. G. P., Exchequer Court, Ottawa.
- Cauchon, N., C.E., 164 Waverley St., Ottawa.
- Charlton, Hon. W. A., M.P., ex-Minister of Crown Lands for Ontario, Lumberman and Limit Owner.
- China, Consul General of, (Hon. Mr. Wang), Ottawa.
- Chipman, W., 346 Frank St., Ottawa.
- Chown, Geo. Y., President Canadian Forestry Association, Kingston.
- Christie, H. R., School of Forestry, University of Toronto.
- Chubbuck, C. E. D., 350 Somerset St., Ottawa.
- Claire, R. K., 230 Clemow Ave., Ottawa.
- Clark, A. E., Toronto.
- Clark, J. A., Expt. Sta., Charlottetown, P.E.I.
- Clark, Dr. Judson F., Lyford, Clark & Lyford, Vancouver, B.C.
- Clarke, Chas. S., 407 Somerset St., Ottawa.
- Cochrane, R. J., 112 Lascar St., Ottawa.
- Cole, T. B., Ottawa.
- Collins, J. R., Fassett Lumber Co., Fassett, Que.
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- Cook, Fred, Ottawa, rep. *London Times*.
- Coolican, P. T., 419 Daly Ave., Ottawa.
- Conn, H., S., Ottawa.
- Cornellier, L. P., Ottawa University.
- Costigan, Hon. John (Senator), Edmundston, N.B.
- Cote, Louis, St. Hyacinthe, Que.
- Cottlee, Herbert, 3 Cathcart Sq., Ottawa.
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- Cream, Daniel, 308 Pine Ave. West, Montreal.
- Creighton, C. D., Toronto.
- Crombie, W. R., of E. H. Lemay, 81 New St., New York City.
- Crothers, Hon. T. W., Minister of Labour, Ottawa.
- Crowe, W. J., 906 St. Catharine St. East, Montreal.
- Cummings, M. M., River Desert, Que.
- Curry, Nathaniel, President Canadian Manufacturers' Assn., Montreal.
- Davidson, Hugh, (Hastings Shingle Mfg. Co.), Vancouver, B.C.
- Davis, A. M., McAuliffe-Davis Lumber Co., Ottawa.
- Davis, L., 94 Chapel St., Ottawa.
- Davison, Frank, Member Com. of Conservation, Bridgewater, N.S., and 117 Spadina Road, Toronto.
- Day, James R., 172 O'Connor St., Ottawa.
- Denis, Leo G., Com. of Conservation, Ottawa.
- Denison, R. Seldon, Breeze, Denison & Co., saw-mill mfrs., Napanee, Ont.
- Dick, W. J., Com. of Conservation, Ottawa.
- Dionne, G. L., Amqui, Que.
- Doherty, T. K., Chief of Publications Branch, Dept. of Agriculture.
- Dolan, Dominic J., University of Ottawa.
- Donnelly, Thomas, Deseronto, Ont.
- Doucet, J. A., Forestry Branch, Dept. of the Interior, Ottawa.
- Dowling, D.B., Geological Survey, Ottawa.
- Drake, E. F., Irrigation Branch, Dept. of Interior, Ottawa.
- Driscoll, D. J., 143 Gloucester St., Ottawa.
- Dufresne, Thomas, 452 Pie IX Ave., Maison-neuve, Que.
- Dunlop, N. Stewart, Claims Agent Eastern Division Canadian Pacific Railway, Montreal.
- Dwight, T. W., B.Sc.F., Forestry Branch, Dept. of the Interior, Ottawa.
- Dyer, Mrs. W. E. L., representing Montreal Women's Club, 310 Grosvenor Ave., Montreal.
- Eadie, Rev. Robt., 1321 Wellington St., Ottawa.
- Eastcott, A. L., Pembroke Lumber Co., Pembroke.
- Eastcott, W. M., Ottawa.
- Edgar, F. G., Faculty of Forestry, University of Toronto.
- Edgar, N. N., Arthur St., Ottawa.
- Edwards, C. M., Watson & Todd Co., Ltd., Ottawa.
- Edwards, Gordon C., Ottawa.
- Edwards, Hon. W. C., Ottawa, Past President Canadian Forestry Association.
- Egan, H. K., Hawkesbury Lumber Co., Ottawa.
- Ellis, L. M., C.P.R. Forestry Dept., Winnipeg, Man.
- Elmitt, T. F., Ottawa, Ont.
- Engrem, E. M., 112 Fourth Ave., Ottawa.
- Evans, A. Kelly, Ontario Fish & Game Commissioner, Toronto.
- Everist, R. E., Saskatchewan Exper. Station, Scott, Sask.
- Fairfield, W.A., Lethbridge, Alberta.
- Fenton, J. W., 359 Cooper St., Ottawa.
- Ferguson, P., Tate, Sask.
- Fernow, Dr. B. E., Dean of the Faculty of Forestry, University of Toronto.
- Filion, W. A., of E. H. Lemay, 683 St. Denis St., Montreal.
- Finlayson, Ernest H., Forest School, University of Toronto.
- Firstbrook, W. A., of Firstbrook Box Co., Toronto, representing Toronto Board of Trade.
- Fisher, Hon. Sydney, ex-Minister of Agriculture.
- Fleming, W. J., 49 Brooke Ave., Westmount, Que.
- Fogarty, W., 374 Slater St., Ottawa.
- Foster, Hon. Geo. E., Ottawa.
- Foster, Hon. J. G., United States Consul General to Canada, Ottawa.
- Fox, Geo. M. (ex-Warden of Wellington County), Drayton, Ont.
- Fraser, J. B., Lumberman, Ottawa.
- Fraser, M. F., 279 Arlington Ave., Ottawa.
- Fraser, Rev. R. Douglas, Presbyterian Publications, 60 Bond St., Toronto.
- Fream, Edward J., 608 Leeson & Lineham Block, Calgary, Alta.
- Gagne, Phillippe, Ste. Luce, Rimouski County, Que.
- Gardner, Geo. C., Manager Bank of Toronto, Ottawa.
- Garratt, R. S., Wellington, Ont.
- Genest, Arthur T., 519 King Edward Ave., Ottawa.
- Gibb, Lachlan, J.P., Montreal.
- Gilbert, A. V., 383 Albert St., Ottawa.
- Gillies, D. A., Braeside, Ont.
- Gilmour & Hughson, Hull, Que.
- Gillmor, John M., 522 Rideau St., Ottawa.
- Godfrey, Ernest H., Census & Statistics Branch, Ottawa.
- Goodeve, A. S., M.P., Kootenay, B.C.
- Gordon, Geo., ex-M.P., Cache Bay, Ont.
- Gordon, P. D., 80 St. Francois Xavier St., Montreal.
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- Gow, John, 140 Parkdale Ave., Ottawa.
- Graham, E. J., Buckingham, Que.
- Graham, James, Teulon, Man.
- Graham, Martin, 23 Forest Hill Road, Toronto, Ont.
- Graham, W., Fortune, Kamloops, B.C.
- Grant, Sir James, M.D., Ottawa.
- Gratton, N., 410 Nelson St., Ottawa.
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- Guy, Stanislas, Sandy Bay, Matane County, Que.
- Guendon, Romeo, University of Ottawa.
- Guppy, Harry J., 502 Lyon St., Ottawa.
- Gussow, W. T., Dominion Botanist, Ottawa.
- Hall, E. H., L.H.D., Sec. of Association for Protection of the Adirondacks, 154 Nassau St., New York City.
- Haney, F. R., C.P.R., Montreal, Que.
- Hanley, Denis, Read, Ont.
- Hardy, Edgar D., 42 Central Chambers, Ottawa.
- Hare, W. A., 38 Preston St., Ottawa.
- Harkom, Lt.-Col. J. W., Director Canadian Forestry Assn., Melbourne, Que.
- Harris, J. A., Ottawa University.

- Ogilvie, Robert M., 464 Besserer St., Ottawa.
 Ogilvie, William, Mackenzie Apartments, McLeod St., Ottawa.
 O'Leary, P., Strong Lumber Co., Orillia.
 Oliver, Hon. Frank, M.P., ex-Minister of the Interior.
 O'Neill, Frank, Rouleau, Sask.
 Osler, Sir Edmund B., M.P., Toronto, Ont.
 Ottawa, Anglican Archbishop of. (Dr. Hamilton).
 Parker, Rev. W. F., 257 Bronson Ave., Ottawa.
 Patching, R., Forestry Branch, Ottawa.
 Patterson, Capt. Joseph, 293 Echo Drive, Ottawa.
 Pearce, Wm., C.E., C.P.R. Irrigation Dept., Calgary, Alta.
 Pelletier, Louis E., manufacturer, St. Donat, County Rimouski, Que.
 Perley, Hon. G. H., M.P., Ottawa.
 Perreault, Edward E., 192 Osgoode St., Ottawa.
 Pettis, C. R., Superintendent of State Forests, Albany, N.Y.
 Piché, G. C., M.F., Chief of Forest Service, Dept. of Lands and Forests, Quebec.
 Pillar, S. A., 149 Second Ave., Ottawa.
 Pinchot, Gifford, President American Conservation Association, Washington, D.C.
 Plant, E. C., Mackarell & Co., Ottawa.
 Plant, Frank J., 179 Patterson Ave., Ottawa.
 Poliwka, H. B., Burstall & Co., Quebec.
 Power, Stephen, 69 Baird St., Ottawa.
 Power, Wm., M.P., Quebec.
 Power, W. Gerard, Manager and Secretary River Ouelle Pulp & Lumber Co., St. Pacome, Que.
 Prettie, R. D., Forestry Inspector, C.P.R., Winnipeg.
 Price, Herbert M., Past President Canadian Forestry Assn., Quebec, Que.
 Printz, Carl J., Vice Consul for Norway for Ontario, Toronto.
 Ranger, D. V., 395 Daly Ave., Ottawa.
 Rankin, W. D., M.D., Woodstock, N.B.
 Read, Chas. E., Jr., Riordon Paper Co., Merriton, Ont.
 Read, Rev. W. A., 760 Somerset St., Ottawa.
 Reaume, Allan, 107 Echo Drive, Ottawa.
 Reid, James, Montreal, Que.
 Renison, Ven. Robert J., Anglican Archdeacon of Moosonee, Moose Factory, Hudson Bay, Canada.
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 Rheault, J. E., Disraeli, Que.
 Richardson, R. T., Woodroffe, Ont.
 Riley, Hon. Geo. (Senator), Victoria, B.C.
 Roberts, Everett H., Forestry Division, Laurentide Co., Grand Mere, Que.
 Robertson, Dr. J. W., Chairman Commission on Technical Education, Member Commission of Conservation, Ottawa.
 Robertson, R., Dominion Experimental Farm, Napan, N.S.
 Robinson, Hiram, President Upper Ottawa Improvement Co., Past Pres. Canadian Forestry Assn., Ottawa.
 Robinson, Miss M., Forestry Branch, Ottawa.
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 Rochester, J. F., 87 Britannia St., Hull, Que.
 Rosamond, James, Almonte, Ont.
 Ross, A. H. D., M.F., Lecturer in Forestry, University of Toronto.
 Ross, H. C., Dept. of Indian Affairs, Ottawa.
 Ross, Norman M., Chief of Tree Planting Division, Forestry Branch, Dept. of the Interior, Indian Head, Sask.
 Ross, Walter M., J. R. Booth Co., Ottawa.
 Rothrock, Dr. Joseph T., Consulting Forester, West Chester, Penn., Secretary Penn. Forestry Commission, one of the pioneers of forestry in North America.
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 Scandrett, W. L., Faculty of Forestry, University of Toronto.
 Schreiber, Collingwood, 192 Argyle Ave., Ottawa.
 Sexsmith, Jno. A., M.P., Chairman Committee on Agriculture, House of Commons, Ottawa.
 Shepherd, R. W., Proprietor Greenwood Orchards, 118 Notre Dame St. W., Montreal.
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 Shore, J. Willoughby, 225 Daly Ave., Ottawa.
 Shuttleworth, E. I., 29 Euclid Ave., Ottawa.
 Simard, J. F., Ottawa University.
 Simpson, E. R., Summerland, B.C.
 Sinclair, Dr. S. B., Dean of the School for Teachers, Macdonald College, Que.
 Sneyd, R. E., 168 Cobourg St., Ottawa.
 Smith, Henry, 69 Primrose Ave., Ottawa.
 Smith, Thomas, 35 Somerset St., Ottawa.
 Soutter, Alex., 159 Daly Ave., Ottawa.
 Spencer, J. B., 154 Carling Ave., Ottawa.
 Spencer, Chas., Third Ave., Ottawa.
 Sproule, Hon. T. S., Speaker of the House of Commons, Ottawa.
 Staniforth, S. J., Fasset Lumber Co., Fasset, Que.
 Stanley, M., Perth, Ont.
 Staples, Miss Lillian M., Wycliffe, B.C.
 Staples, Otis, Wycliffe, East Kootenay, B.C.
 Steckel, Rene, 303 Cooper St., Ottawa.
 Stephenson, Robert, Laurentide Paper Co., Grand Mere, Que.
 Sterling, E. A., F.E., Forester, Pennsylvania Railroad Co., Philadelphia, Penn., official representative of the American Forestry Assn.
 Stevenson, T. J., Sales Manager, Riordon Paper Co., Montreal.
 Stewart, E., F.E., ex-Superintendent of Forestry, Dept. of the Interior, Canada, Past President Canadian Forestry Association, Toronto.
 Story, J. A., Fraser-Bryson Lumber Co., Ltd., Ottawa.
 Stuart, William, 180 First Ave., Ottawa.
 Sunderland, J. T., 22 West Hancock Ave., Detroit, Mich., U.S.A.
 Sunstrum, John, Montreal, Que.
 Sutton, W. S., Woodstock, N.B.
 Swaine, J. M., Asst. Entomologist, Central Experimental Farm, Ottawa.
 Symes, P. B., 326 Lyon St., Ottawa.
 Taggart, C. H., D.L.S., 25 Patterson Ave., Ottawa.
 Tilt, L. C., Faculty of Forestry, University of Toronto.
 Thomas, H. I., J. R. Booth Co., Ottawa.
 Thompson, Wm., *Farmers' Advocate*, London, Ont.
 Thomson, Miss M., Forestry Branch, Ottawa.
 Thorburn, Dr., 211 Daly Ave., Ottawa.
 Thornton, Geo. W., Almonte, Ont.
 Thornton, J. W., C.P.R., Montreal.
 Thrall, J. H., 66 Park Ave., Ottawa.
 Tilston, W. S., Manager Trans. Board of Trade, Montreal.
 Towsley, E. D., 161 Nepean St., Ottawa.
 Trask, Mrs. A. L., Oyama, B.C.
 Trask, Egbert, Oyama, B.C.
 Tully, John, 487 Laurier Ave. W., Ottawa.
 Tummon, W. E., Chairman Reforestation Committee, Hastings County Council, Ontario.
 Turner, J. J., Jr., Peterborough, Ont.
 Ussher, C. E. E., Gen. Passenger Traffic Manager, Canadian Pacific Ry., Montreal, Director Canadian Forestry Association.
 VanDusen, W. J., Faculty of Forestry, University of Toronto.
 Viens, Ephrem, Chemist Dept., Public Works, Ottawa.
 Wadsworth, G. F., 86 Carling Ave., Ottawa.
 Walker, P. C., Shephard & Morse, Ottawa.
 Wallis, V. Brown, Forestry Branch, Ottawa.
 Watson, Neil, Mull, Ont.
 Webb, S. J., 39 Belmont Ave., Ottawa.
 Webster, F. T., Billings' Bridge, Ont.
 Whitcher, Arthur H., Secretary Geographic Board of Canada, Dept. of Interior, Ottawa.
 White, Aubrey, Deputy Minister of Lands & Forests for Ontario, Past President and Director Canadian Forestry Association, Toronto.
 White, J. B., Manager Woods Dept. and Sawmills of Riordon Paper Co., Calumet, Que.
 White, James H., B.S.F., Lecturer, Faculty of Forestry, University of Toronto.
 White, James, F.R.G.S., Sec. Commission of Conservation, Ottawa.
 Whyte, R. B., 60 Rideau St., Ottawa.
 Wilson, Ellwood, Forest Engineer, Laurentide Paper Co., Director Canadian Forestry Association, Grand Mere, Que.
 Wise, E. O., 143 Queen St., Ottawa.
 Witten, Stewart, Forestry Branch, Ottawa.
 Zavitz, E. J., B.A., M.S.F., Forester Ontario Dept. of Agriculture, Prof. Ontario Agricultural College, Guelph, Ont.

Conservation Commission Meeting, 1912

The Commission of Conservation held its third annual meeting, according to statute, on Tuesday, Jan. 16. The Commission met in the Carnegie Library, Ottawa, the members present being Hon. Clifford Sifton, who presided, Sir Safford Lindsay, of Ottawa; Hon. Martin Burrell, of Ottawa; Hon. H. S. Beland, of St. Joseph, Beauce, P. Q.; Hon. W. C. Edwards, of Ottawa; Dr. B. E. Fernow, of Toronto, M. P.; Dr. Geo. Bryce, of Winnipeg; Messrs. Frank Davidson, of Regina; N. S.; C. A. McLeod, of Ottawa, and J. P. Mackay, of the Globe, Toronto.

The chairman opened the meeting with a brief speech and then called on the different technical officers of the Commission.

Dr. C. A. Hodgetts, Medical Advisor to the Commission, reported for the Committee on Public Health, touching on the work of that committee in regard to tuberculosis, the establishment of a Dominion Department of Public Health and of a Dominion Laboratory, where sera of guaranteed strength and purity could be prepared, infantile paralysis, town planning and housing, rural sanitation, inspection of meat, the Ottawa typhoid epidemic of 1911, bovine tuberculosis, and the establishment of the Canadian Public Health Association.

Mr. F. C. Nunnick, agricultural expert of the Commission, then presented the report of that section. Among the topics touched upon were the agricultural survey of representative areas of the different provinces, and the investigation of alfalfa-growing in the province of Quebec; a number of suggestions for the future work of the Commission were also given.

Mr. W. J. Dick, mining expert for the Commission, presented the report of that section, discussing fully the inspection of coal mines made under the direction of the Commission, making recommendations for the bettering of government regulations in regard to natural gas, records of drillholes and plans of abandoned seams, and recommending a Royal Commission to investigate the high death-rate in the mines of Canada.

The chairman then brought up the matter of peat fuel, reading a memorandum prepared by the Superintendent of Mines on the establishment of a peat industry in Canada.

Mr. M. J. Feltus, acting and assistant secretary of the Commission, gave a report for the Fisheries, Game and Fur and Fur Animal Committee. Among the items touched on were the investigations of the fur and game resources of the Northwest provinces, the game and such statistics for trapping and the commercial nature of the published statistics on animal resources.

Mr. T. O. Jones, Executive Assistant of the commission, has reported on the work done in the investigation of Wagon-Water Scurvy, and discussed the method of a "poison surface" for the disease.

Mr. A. V. White was reported on the British Columbia water system. He gave a summary of the arrangements made with the provincial government in regard to the work, and also the work done under the Dominion stipulations awarded by the Railway Board and by the Commission's agreement by the Province. He finally gave some data for the future of the water supply.

Mr. Tupper also reported for the public work part of the Commission.

The New York Times, 1999.

Dr. B. J. Vernon then reported on the Tongue Point forest survey. After quickly going over the outline of the survey, describing the data collected, the nature of the survey, and the preliminary findings, he briefly looked in the Columbia Forests Journal, 1969, page 163, for some of the working facts revealed as the results of the work of the party. The top third of the mountain was found to be 40 per cent of the area, the lower forest area slightly less, virgin forest (approximately) about 10 per cent, and the forest area about eight per cent, the upper forest area about 10 per cent, and the lower forest area about 10 per cent. The total area of the forest of the mountain was about 10 per cent and a half million feet and about 100 to 150 million feet.

exhausting the supply of merchantable timber in twenty years.

The chairman also discussed the work of the commission in forestry matters. It had taken an active part in getting the Rocky Mountain forest reserve and the obtaining of legislation in regard to the measures to be taken by railways against forest fires.

Afternoon Session.

In the afternoon the first item on the program was an address by Dr. J. W. Robertson, who gave a report in some detail on the agricultural survey of the Dominion. He discussed also seed-selection, weeds and plant diseases and illustration farms.

THE ROCKY MOUNTAIN FOREST RESERVE.

Mr. R. H. Campbell, Director of Forestry, then addressed the Commission on the Rocky Mountain forest reserve. He referred to the boundaries of the reserve as first set apart by Council and explained how it had been necessary to enlarge these. The general principle laid down in marking out the eastern boundary of the reserve was to include all land lying at an elevation of 4000 feet or over, above which agriculture could not be carried on. Timber line was, generally speaking, at an elevation of 6000 to 7000 feet. The chief trees were Engelmann spruce, Douglas fir and lodgepole pine. The supply of timber was very important for the coal mines of the Eastern slope, and the reserve was also important on account of its including the sources of the chief streams watering the prairies, and hence was important for irrigation, domestic water supply and power.

Mr. Campbell then summarized the provisions of the Forest Reserves Act of 1911. He then went on to treat particularly the provisions of the Act. Only portions of the reserve were made into game preserves, but in these a very fair amount of protection had been given and the results were noticeable.

The two great objects of the administration of the reserve, however, were the protection of the timber from fire and the protection of the water supply. The cost of administration of the forests in Germany was at least one dollar per acre, and in the United States two cents per acre were allowed for the administration. So far, the government of Canada had not granted even one cent per acre for the administration of the Rocky Mountain reserve. There were many sources of danger from fire within the reserve. The greatest of these was the railways. The administration must be got into shape at once, so as to be effective when danger should come. Trails must be built to points commanding a view of the surrounding country, so as to discern fires,

and also all through the forest so that men can get quickly to the scene of a fire. There should also be a system of telephones, so that help could be quickly summoned. The disposal of the debris after lumbering was also important. A paramount question was that of the reproduction following lumbering. In the administration of the reserve there must be one man at the head, called perhaps an inspector. The reserve must be, for administrative purposes, broken up into districts, probably four in number, with a scientifically trained man in charge of each. Under these there should be a staff of fire-rangers, probably a dozen rangers for each division.

After resolutions favoring the extension of certain portions of the work of the Committee on Lands and for the establishment of a Dominion Laboratory had been agreed to, it was moved by Dr. Geo. Bryce, seconded by Mr. McCool, and carried;— That Dr. B. E. Fernow be appointed as the special representative of the Commission of Conservation to co-operate with His Honor Judge Mabee, Chairman of the Railway Commission, in the granting of regulations, under the law requiring railways to protect from fire forests through which they pass, and that Hon. W. C. Edwards, Dr. Fernow and the Chairman of the Commission be a committee to further the general purposes of the work in connection with the Railway Commission.

It was also moved by Hon. W. C. Edwards, seconded by Rev. Dr. Bryce, that in view of the enormous importance of this subject the Commission of Conservation recommends that an appropriation of not less than \$110,000 be provided for forest protection in the Rocky Mountain forest reserve during the fiscal year 1912-3. The motion was agreed to.

Dr. J. G. Adami was, on motion, appointed the representative of the Commission, in conjunction with representatives of the province of Ontario and the city of Toronto, on a commission to secure a more complete organization of agencies for the suppression of tuberculosis.

Resolutions were also passed directing the Committee on Public Health to represent the Commission on questions regarding town planning, approving the experiments regarding the use of peat for fuel and urging their continuance, making certain changes in the personnel of the Commission in accordance with certain changes in the Dominion and provincial ministries and appointing Dr. C. C. Jones and Hon. H. S. Beland as chairmen of the Fisheries, Game and Fur-bearing Animals Committee and the Water-powers Committee respectively, and adding to the personnel of certain committees.

The meeting then adjourned.

La Forêt, la Température et le Régime des Pluies.

[L'article qui suit est un extrait du "Manuel de l'arbre", un ouvrage publié par le "Touring Club de France". Le titre du livre est bien défini dans les paragraphes suivants pris de l'introduction.]

Ce petit livre est dédié à la jeunesse. Il répond au désir récemment exprimé par MM. les Ministres de l'Instruction publique et de l'Agriculture que des notions sommaires de sylviculture et d'améliorations pastorales soient données dans les écoles.

Son but est, surtout, d'inspirer aux enfants l'amour de l'arbre et des forêts, de faire ressortir l'utilité, le rôle essentiel que ces sociétés végétales jouent dans la nature et leurs rapports nombreux et étroits avec nos sociétés humaines. — *Ed.*

En été, quand, après avoir traversé une grande plaine brûlée par le soleil, on arrive sous les ombrages d'une forêt, on éprouve une délicieuse fraîcheur. En hiver, c'est une impression contraire que l'on ressent et l'on se trouve réchauffé, protégé contre le froid par le couvert ou l'abri des arbres. Les observations thermométriques sont d'accord avec ces impressions.

Sous bois la température moyenne est moins chaude en été, moins froide en hiver qu'en terrain découvert. Les écarts de la température diurne sont également atténués : le thermomètre s'élève moins haut dans le milieu du jour et s'abaisse à un degré moindre au coucher du soleil. Ainsi la forêt régularise la température et cet effet se propage dans un certain rayon à l'entour de ses massifs. Elle a donc une influence comparable à celle de la mer dont la température, beaucoup plus constante que celle de la terre, tantôt réchauffe, tantôt refroidit ses rivages. Je n'ai pas besoin de dire combien cette régularisation du climat est favorable à la santé de l'homme aussi bien qu'à la prospérité de ses cultures. Celles-ci ont même à redouter la gelée et les ardeurs du soleil.

La même influence régularisatrice est exercée par les forêts sur le régime des pluies. Dans les régions boisées, les pluies sont plus fréquentes, plus prolongées, mais moins violentes.

La caractéristique des régions boisées est au contraire d'avoir des pluies rares, mais torrentielles. L'explication de ces faits est simple. L'atmosphère qui entoure les forêts est presque toujours humide. Après la pluie, l'eau séjourne sur le sol ombragé et ne s'évapore que très lentement. D'autre part, les racines vont chercher jusqu'à une grande profondeur l'eau nécessaire à la formation des tissus de l'arbre. Une grande partie de cette eau est rendue peu à peu par la transpiration de feuilles à l'atmosphère qui ainsi conserve tout l'été un degré d'humidité sensible, tout plus élevé qu'en terrain découvert. Or, on sait que l'humidité atmosphérique se résout d'autant plus facilement en pluie que l'air est plus abondamment chargé de vapeur d'eau et qu'ainsi il approche davantage de ce que l'on appelle le "point de saturation". Le moindre abaissement de la température suffit alors à provoquer la condensation pluviale. C'est évidemment de la température peut être peu variée par la forêt elle-même. On a constaté en effet que les couches d'air qui composent l'atmosphère au-dessus des forêts boisées sont jusqu'à une hauteur assez considérable plus froides que dans les régions découvertes. Les ardeurs du soleil, on remarque qu'elles passent au-dessus de grands massifs boisés sans les brûler et qu'elles tombent sur la terre sans qu'il arrive que le sol s'y refroidisse considérablement, montrant la grande influence que les forêts ont sur le climat.

Il résulte de là que les forêts

les courants aériens, déjà chargés d'une certaine quantité de vapeur, arrivent en contact avec cette colonne d'air plus humide et plus froid qui surmonte et enveloppe les forêts, ils abandonnent assez fréquemment, sous forme de pluie, de brouillard, de rosée, une partie de leur humidité. Voilà pourquoi on entend dire que les forêts attirent la pluie. Voilà pourquoi dans les vastes plaines de la Russie méridionale où les récoltes sont très fréquemment compromises par la sécheresse du climat, le Gouvernement et parfois les propriétaires particuliers font planter à l'entour des terres de culture de grands rideaux boisés.

C'est bien aussi à la disparition des forêts qu'il faut pour une grande part attribuer les sécheresses prolongées qui désolent certaines contrées telles que la Grèce, l'Asie Mineure, la Syrie, l'Algérie, l'Espagne, le Midi de la France, presque tous les rivages enfin de la Méditerranée. De faits nombreux relatés par les historiens, par les voyageurs, par les géographes et entre autres par notre grand géographe français Elisée Reclus, il ressort nettement que ces régions étaient autrefois mieux arrosées, plus riches en eaux courantes, moins arides.

Elles étaient à coup sûr beaucoup plus fertiles et prospères. Leur climat semble s'être asséché. Qu'elles pleurent à jamais leurs forêts détruites! Car c'est surtout sous leur ciel chaud et lumineux que l'on peut dire: 'Terre sans eau, terre sans récolte.'

¹Ensemble des caractères que présentent les pluies dans une région déterminée, notamment au point de vue de leur fréquence, de leur intensité, de leur distribution, suivant les saisons, etc.

Rules Will be Framed.

Of the very greatest importance to forestry interests was the session of the Railway Commission held at Ottawa, on February 7th, the first morning of the Association's conven-

tion, when the matter of regulations governing railways in the matter of forest fires arising from the operation of their lines through forested districts was before the Board.

The question came up on an application from the British Columbia Department of Lands, asking for an order of the Board regulating the operation of locomotives within the forest regions of the province. This order was granted.

Judge Mabey said the regulations would be drawn up and submitted to the parties concerned and, if too drastic, amended. The question, he thought, should have come up twenty five years ago.

The matter of oil-burning locomotives was discussed at some length. The officials of the C.P.R. said these locomotives were now being used on their western lines, but were found expensive. Great Northern Railway representatives reported that their road was using oil-burning locomotives with satisfaction. Dr. Fernow urged the use of oil-burning locomotives, as tending to keep down the number of forest fires.

Will Study Forest Insects.

Mr. J. M. Swaine, M.Sc.A., late of Macdonald College, has been appointed to the staff of the Central Experimental Farm, and will, under the direction of Dr. C. Gordon Hewitt, carry on the study of insects affecting forest trees. His special work is indicated by the designation Assistant Entomologist for Forest Insects.

Mr. Swaine is a graduate of Cornell University, where he obtained both the Bachelor's and the Master's degrees in Agriculture. He has spent five years on the staff of the Macdonald College, as lecturer in the biological department, of which Prof. Lochhead is the chief.

Mr. Swaine is at present engaged on special study of the *Scolytidae*, or bark-boring beetles.

With the Forest Engineers.

Annual Meeting C.S.F.E.

The annual meeting of the Canadian Society of Forest Engineers was held in Ottawa on Thursday evening, February 8, at eight o'clock.

The President, Dr. B. E. Fernow, occupied the chair, and there were also present the following active members: Dr. J. F. Clark, of Vancouver, B.C.; N. M. Ross, of Indian Head, Sask.; A. H. D. Ross and Dr. C. D. Howe, of the University of Toronto Faculty of Forestry; E. J. Zavitz, of the Ontario Agricultural College, Guelph, Ont.; Ellwood Wilson, of Grand Mère, P.Q.; L. M. Ellis, of the C.P.R. Forestry Dept., and R. H. Campbell, H. R. MacMillan and E. W. H. Jacombe, of Ottawa, Ont.

After some discussion regarding the finances of the society, it was resolved that associate members, as well as the active members, should receive the Forestry Quarterly as return for a portion of the membership fees.

On motion Mr. H. R. MacMillan was appointed auditor for the current year.

A discussion was introduced by Mr. Wilson as to the feasibility of standardizing mapping and estimates of cost. The value of an interchange of ideas among the members on this and other subjects was pointed out. Many of them were doing private work, and the benefit of any progress on their part in regard to methods in the absence of any publication was lost. The subject was especially suited to the present stage of development of forestry in Canada because the majority of foresters in the Dominion were doing mapping and estimating work almost exclusively.

On motion a committee was appointed to investigate the possibility of standardizing the maps along the lines suggested.

Mr. Wilson was appointed to investigate the practicality of the formation of an international society of foresters.

The meeting then adjourned.

Notes on Rocky Mountain Reserve.

The plans under consideration for the management of the Rocky Mountain forest reserve contemplate the division of the whole reserve into four districts, viz.: (1) from the International boundary north to the High River district; (2) from the High River district north to the headwaters of the Red Deer river, or thereabouts; (3) from this last-named point to the Athabasca, and (4) all north of this to the northern boundary of the reserve.

Each of these districts will have a supervisor, a technical assistant and a staff of rangers. The central office will probably be located in Calgary, from which the Cooking Lake and Cypress Hills reserves, with any others that may, and in all probability, will be established to the north, will be administered.

Trails will be put through with all possible speed and telephone lines established. Houses and stables for the rangers will be constructed at a number of important points. The rangers must live on their beats.

A considerable number of assistant foresters will be required to work out the organization properly, in addition to the local men to fill the lower offices.

Mr. H. B. Bradley, Engineer for the New Brunswick Railway Co., was one of New Brunswick's representatives at the late convention.

Mr. C. A. York, Manager of the firm of York, Clark and Lynch, forest engineers, represented most of the conventional foresters.

Mr. R. H. Campbell, Superintendent of Forestry, Ottawa, was the host at a very pleasant and informal dinner given to the professional foresters in attendance at the convention on Thursday evening, February 8th, at the Laurentian Club, Ottawa. The guests comprised Dr. B. E. Fernow, Dr. J. F. Clark, Dr. C. D. Howe, and Messrs. E. J. Zavitz, N. M. Ross, Ellwood Wilson, A. H. D. Ross, L. M. Ellis, H. R. MacMillan, T. W. Dwight, E. G. McDougall, D. R. Cameron and F. W. H. Jacombe.

Mr. J. R. Dickson has been hard at work all season at his work of technical assistant on the Rising Mountain forest reserve, with headquarters at Dauphin, Man.

Mr. F. W. Beard has been assigned to duty as technical assistant on the Duck Mountain forest reserve, also with headquarters at Dauphin, Man.

The forest engineers who have been during this winter at headquarters at the Forestry Branch, Ottawa, include Messrs. E. G.

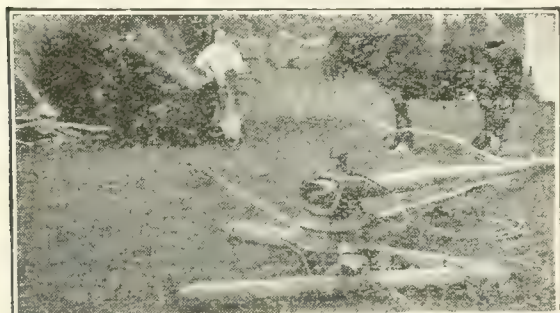
McDougall, T. W. Dwight and D. Roy Cameron.

Mr. P. Z. Caverhill has been given the duties of technical assistant on the Cypress Hills reserve.

Mr. G. H. Edgecombe is making his headquarters at Edmonton this winter. His address is c/o Commissioner Dominion Parks, Edmonton, Alta.

Messrs. G. C. Piché and A. Bédard, forest engineers of the Quebec Department of Lands and Forests, were in attendance at the convention. Their many friends among the forest engineers regretted that pressure of official business compelled their cutting their stay short.

Many of the students of the University of Toronto Faculty of Forestry visited Ottawa for the convention.



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I hereby suggest the names of the following persons as likely to become members of the Canadian Forestry Association:

Name.

Address

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(Signed)

Canadian Forestry Journal

VOL. VIII.

MARCH-APRIL, 1912

No. 2.



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is the national organization for the informing of public opinion in the effort to secure a rational development of the Canadian Forests through the co-operation of national, provincial and municipal organizations and private enterprises. The objects of the Association are:

- (1) The exploration of the public domain, so that lands unsuitable for agriculture may be reserved for timber production.
- (2) The preservation of the forests for their influence on climate, soil and water supply
- (3) The promotion of judicious methods in dealing with forests and woodlands.
- (4) Tree planting on the plains, and on streets and highways.
- (5) Reforestation where advisable.
- (6) The collection and di-semination of information bearing on the forestry problem in general.

To promote these ends the Association publishes the *Canadian Forestry Journal*, issues bulletins, arranges for the delivery of free illustrated public lectures, and holds conventions in different parts of Canada.

The Association desires as members all (both men and women) who are in sympathy with this work. The membership fee, which entitles the member to the *Journal*, the annual report and other literature issued, is one dollar per year, (life membership \$10). Applications for membership or requests for information may be addressed to the Secretary, Canadian Forestry Association, Canadian Building, Ottawa, Canada.

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Canadian Forestry Journal

VOL. VIII.

OTTAWA, MARCH 24, 1912.

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Constitution and By-laws of the Canadian Forestry Association

Chrysomelids (Dodd) 56, 74, 81, 101, 102

0 000 500

The name of the Association shall be The Canadian Ecocycle Association.

11. 6384377

[100]

(1) To educate and encourage people from nonwhite backgrounds in dealing with our Indians and woodlands.

cultural, timber and mineral lands, with a view of directing immigration and the pursuits of our pioneers into channels best suited to advance their interests and the public welfare. With this accomplished, a portion of the unappropriated lands of the country could be permanently reserved for the growth of timber.

(4) To encourage afforestation wherever advisable, and to promote forest tree-planting, especially in the treeless areas of our north-western prairies, upon farm lands where the proportion of woodland is too low, and upon highways and in the parks of our villages, towns and cities.

(5) To collect and disseminate, for the benefit of the public, reports and information bearing on the forestry problem in general, and especially with respect both to the wooded and prairie districts of Canada, and to teach the rising generation the value of the forest with a view of enlisting their efforts in its preservation.

(6) To secure such forestry legislation from time to time from the federal and provincial governments as the general interests demand, and the particular needs of the people seem to require.

III. MEMBERSHIP.

Its membership shall include all who pay an annual fee of \$1.00 or a life membership fee of \$10.00.

IV. OFFICERS.

(1) The officers shall comprise an honorary President, a President, a Vice-President, a Secretary, an Assistant Secretary, a Treasurer, the editor of the official organ of the Association and thirty directors.

(2) In addition to the above all past presidents of the Association, from (and including) the Association year 1909-1910, shall be *ex-officio* members of the Board of Directors.

V. ELECTIONS.

These officers shall be elected by ballot at the annual meeting of the Association, and shall serve one year, or until their successors are elected. Vacancies occurring during the year may be filled by the Executive Committee.

VI. EXECUTIVE COMMITTEE.

The officers shall constitute an Executive Committee, and five of the same shall be a quorum, and they will appoint a Vice-President for each province and as far as possible for each provisional district of the Dominion.

VII. ANNUAL MEETING.

The annual meeting of the Association shall be held during the month of February in the City of Ottawa, unless otherwise determined by the Executive Committee of the Association and a notice of one month of the date selected shall be given to each member by the Secretary.

VIII. SPECIAL MEETINGS.

Special meetings shall be held at such times and places as the Executive may decide, a sufficient notice of which shall be sent to each member by the Secretary.

IX. AMENDMENTS.

Amendments of the Constitution can only be adopted by a two-thirds vote of the members present and entitled to vote, and at the annual meeting of the Association, and a notice of such intended amendment shall be given with the notice calling the meeting.

BY-LAWS.

President.

The President shall preside at all meetings of the Association.

Vice-President.

In the absence of the President a Vice-President shall preside at all meetings of the Association; and in the absence of all of them a President *pro tempore* shall be elected by the meeting.

Secretary and Assistant Secretary.

The Secretary shall keep a record of the proceedings of the Association and of the Executive Committee and shall be custodian of all documents, books and collections ordered to be preserved.

He shall conduct the correspondence of the Association and shall keep a list of members with their residences and shall notify members of the time and place of meeting of the Association, and in his absence his duties will be discharged by the Assistant Secretary.

Treasurer.

The Treasurer shall have the custody of all moneys received, and shall deposit or invest the same in such manner as the Executive Committee shall direct, and shall not expend money except under direction or approval of the Executive Committee. The financial year of the Association shall close on December 31st of each year.

Order of Business.

At the regular meeting of the Association the order of business shall be that proposed by the Executive Committee and announced by the Presiding Officer. In the absence of such prepared order of business, the following shall be observed:—

- (1) Calling to order.
- (2) Reading and referring or disposing of letters, accounts, etc.
- (4) Reports of Committees.
- (5) Inquiries and notices of motion.
- (6) President's address.
- (7) Papers, addresses and discussions by members and others invited by the meeting.
- (8) Nomination and election of officers.
- (9) Unfinished and miscellaneous business.
- (10) Adjournment.

Forests of the Oxford House District, N.W.T.

[In the annual report of the Director of Forestry for 1911, recently published, an account is given of work carried on by one of the Dominion fire-rangers, Mr. J. T. Blackford, in the Oxford House district of the Northwest Territories, some distance to the northeast of the present limits of the province of Manitoba. This is a district whose forest conditions are not well known, and the account is therefore reproduced here.—*Ed.*]

Mr. J. T. Blackford, an experienced woodsman acquainted with conditions in the north, was appointed to explore, estimate and map the timber, and act as fire-ranger in the district surrounding Oxford House.

Accompanying this report is a sketch-map made by Mr. Blackford showing the districts which he traversed, and the location of the timbered and burned-over areas. Mr. Blackford travelled south from Oxford House to Minnihik, Clearwater and Rat lakes, and north and east from Oxford House to Fox and Door lakes, covering in all about 5,433 square miles of country.

About 1,612 square miles of this territory still bears merchantable timber; on about 3,821 square miles all the merchantable timber has been destroyed by fire.

There are abundant evidences that this whole country was originally heavily forested with spruce, tamarack, jack pine, balsam fir, birch and poplar. On the islands which have been naturally protected from fire, are dense stands of trees two to three feet in diameter, and around some of the lakes are blackened stumps two to three feet in diameter.

A reliable Indian, between sixty-five and seventy years old, said that 'long ago there used to be lots of fine large timber. Every summer there have been fires, more or less. Long ago (about twenty-five years) there was one terrible fire which ran for many days. We could not see

the sun, and the only way I could get my breath was by putting a piece of blanket over my mouth. The fire started at Robinson Passage and ran from that point to Oxford lake and west as far as Door lake. Up to this time there were lots of car and deer by thousands, but since then we have not had much fur nor have I known one deer to be seen within three or four days' journey from here. Before the fire we saw only an occasional moose, but now there are lots. * * * * Two summers ago we had large fires all around us. The Indians say that many of the fires started inland where there are no people, and that many of them are caused by York boat men. The big fire of twenty five years ago was started by Indians working on a York boat.'

Hunters on their way to the winter hunting grounds are careless with their camp-fires and are responsible for many forest fires. Mr. Blackford found that in this district freighters and trappers are very careful. The Indians, carelessly leaving camp-fires, start forest fires in the Oxford House district every season.

After fire has destroyed the original forest there is nearly always a dense second growth in which jack pine, poplar and larch occur in a greater proportion than in the original forest. This second growth would in fifty or sixty years produce a valuable forest if it were protected from fire. Unfortunately after the first fire there is always a residue of dry stumps, which, together with the inflammable nature of the young growth itself renders a second fire almost inevitable.

Travelling between Fox lake and Norway House Mr. Blackford found that day after day he had to cut his

way through fire killed timber. Fires are driven with such fury in this country that even the rivers are insufficient to stop them. A fire which occurred three or four years ago burned both sides of the quite wide Fox river. Repeated fires destroy all seed-trees, all seed and much or all of the rich upper layers of soil and render it impossible for another valuable forest to start naturally, except after a long period of time. Mr. Blackford observed that this had been the case over large areas in the Oxford House district, that the whole country had been fire-swept many times, chiefly within recent years, that the soil had been impoverished, that where there had been valuable stands of spruce and tamarack there was now nothing but willow, poplar, birch and scattered small spruce. Where fires had been exceptionally fierce or frequent, the country was burned to prairie. Tamarack seems not to be coming in after fires, but where fires have not been frequent there is good natural reproduction of spruce and jack pine, the jack pine usually occurring on the ridges.

On several extensive trips Mr. Blackford never saw the limit of the burned area. Fires have evidently been much more frequent in the country tributary to the routes followed by the York boats than elsewhere.

The muskogs carry fire and have nearly all been burned over.

During the summer Mr. Blackford found no commercial timber of any quantity, but he states that, except for fire, the whole country would be covered with timber two or three feet in diameter.

Around Knoch lake, along Last river, around Nest lake, Moose lake and God's lake, there is timber five to six inches in diameter—spruce, tamarack, poplar and balsam fir. On the islands in these lakes timber is two to three feet in diameter.

Around Oxford lake the timber is all of very recent growth.

On the shore of Munnik lake, where it has been naturally protected from fire, is about two hundred acres of the best timber in the country.

One small grove of timber near Rat lake contained spruce trees thirty eight inches in diameter and eighty feet high. There were here 320 trees per acre over seven inches in diameter, and 844 trees over four inches in diameter. On a jack pine ridge there were 775 trees per acre over five inches in diameter. These small patches are typical of what the whole country would be if it had not been burned.

On the shore of Munnik lake there is a strip of timber five miles long and three quarters of a mile wide, containing trees from eight to twenty inches in diameter, and about seventy five feet high.

For twenty miles northeast from Oxford House there is a strip of timber mostly spruce with some jack pine and very little tamarack and balsam fir, averaging from eight to ten inches in diameter. Along the Last river there has been good timber but it is all burned. Around Deer lake there is a belt of scrubby spruce twenty five miles wide.

It has been represented by travelers following Fox river that the river flowed through timber. Mr. Blackford found only a very narrow fringe of trees along the shore, behind these the country has all been burned. The Indian name Fox is too say that as far as they have traveled in any direction the country is all burned. Between Oxford House and Norway House the timber is larger than any west of north of Oxford House. Unfortunately the best of it has been burned. There is much timber along the water-courses.

Mr. Blackford attended the council meetings of the Indians at God's lake and Oxford House. He explained that the government was sending out men to protect the forest from fire, and that it was in the interest of the Indians to prevent and re-



[Photo J. T. Blackford, 1911.]

Norway House Indians Taking Pledge to Help in Prevention of Forest Fires.

Chief and Councillors in Foreground.

tiguish all fires. The chief and councillors spoke in favour of the work and the Indians seemed during the summer afterward to have been very much impressed and to be acting more carefully than usual. The Hudson's Bay man in charge of the post at God's lake said early in 1911 that he did not know of a single fire started by the God's lake Indians in 1910. This was a most unusual record and he attributed it to the presence and influence of the Dominion fire-ranger.

Mr. Blackford gave the boys at the Indian school at Oxford House a talk on fires and how they were to be prevented. He spoke also to headmen of the York boats, and had them promise to be more careful in the future.

The Indians throughout the district depole the burning of the forest and feel very doubtful about their future should fires continue to destroy the forest and the game.

Mr. Blackford suggests that the Indians may be encouraged to be careful with camp fires if they are given a little badge to wear as In-

dian volunteer fire rangers. Badges have been supplied to the Indians in the Oxford House district.

Timber and game will, for a long time at least, be the chief products of the Oxford House district. There is but little of the territory fitted for agriculture, there are so many ridges, muskegs, streams and lakes. It is, therefore, very important that the timber should be protected from fire.

Canadian Lumbermen's Association.

The Canadian Lumbermen's Association held their annual meeting in the Board of Trade Chambers, Ottawa, on February 6. The president, Lt.-Col. J. B. Miller, of Toronto, being absent, the chair was occupied by Mr. Alex. MacLaurin, of Montreal. About forty members were present. Among other topics the matter of uniform grading rules was discussed, and a committee was appointed to consider the matter and report. The election of officers resulted in the choice of Mr. Alex. MacLaurin, Montreal, as president, Mr. Frank Hawkins, Ottawa, as secretary, Mr. R. G. Cameron, Ottawa, as treasurer, and J. S. Gillies, Brantford, Ont., J. C. Browne, Ottawa, Ont., John Hendry, Vancouver, B.C., and D. C. Cameron, Winnipeg, Man., as vice-presidents.

Investigations on Forest Insects, and Forest Protection.

By C. Gordon Hewitt, D.Sc., Dominion Entomologist, Ottawa.

The problem of the protection of Canada's forests resolves itself into a question of controlling the destructive agencies. Of these fire, being so obvious in its outbreaks and spread, is receiving increasingly great attention in Canada. Not less serious, though usually unnoticed and very frequently attributed to other causes, are the depredations of forest insects which up to the present time have received practically no attention in Canada. We have studied the outbreaks of the larch sawfly and the spruce budworm, it is true, but the injury caused by these insects is slight compared with the destruction which is going on from year to year owing to the depredations of a number of species of widely spread bark beetles which destroy the trees by attacking the bark. Their depredations are frequently closely associated with destruction by fire and are often mistaken for it. When they do not kill the trees before the advent of fire, thereby rendering areas more combustible, they weaken them beyond the recuperative stage, or they may follow fire and bring about the final destruction of timber which might otherwise have recovered.

At present little or no information is at hand as to the extent of the destruction of Canadian forests by these insects, owing to the fact that no attention has been paid to these destructive agencies; consequently, in discussing this question, it is impossible to give actual instances. We have only to go into the neighbouring states of the United States, however, where considerable attention has been paid to being paid to the depredations of forest insects, to find evidence of great destruction by them. A few

instances mentioned by Dr. Hopkins, who is in charge of the forest insect investigations of the United States Bureau of Entomology, may be mentioned. The Douglas fir throughout the region of the Rocky Mountains from New Mexico to British Columbia has suffered severely from two ravages of the Douglas fir beetle, with the result that a large percentage of dead timber is found, much of which will be a total loss. During the past fifty years the Englemann spruce beetle has caused widespread devastation in the Rocky Mountain region in forests of Englemann spruce, in some sections killing from 75 to 90 per cent of the timber of merchantable size. In the Black Hills National Forest of South Dakota it is estimated that during the past ten years more than a billion feet of timber have been destroyed as a direct result of the work of the Black Hills beetle. Speaking of the Eastern spruce beetle, Dr. Hopkins states that during the period between 1818 and 1900 there were several outbreaks of this insect in the spruce forests of New York, New England and northeastern Canada. It caused the death of a very large percentage of the mature spruce over thousands of square miles. In the aggregate many billions of feet of the best timber were destroyed and the larger areas of this dead timber furnished fuel for devastating forest fires with the result that in most cases there was a total loss. In his report for the year ending June, 1910, Dr. Howard, the Entomologist of the United States Department of Agriculture, and Chief of the Bureau of Entomology, in reporting on forest insects, says: "The prolonged depredations



[Courtesy "Sunshine."]

A Typical Lumberman's Camp.

tions of the year have been by the *Dendroctonus* beetles on the pines, spruce and Douglas fir of the Northwest and Pacific Coast and on the pine of the Southern States. As knowledge increases of the actual losses of merchantable timber caused principally by these beetles, it appears that former estimates have been conservative and that these beetles are in fact one of the principal factors in causing the enormous continued waste of the most valuable timber resources of the Rocky Mountains and Pacific Coast regions and of the Southern States.'

What is true for the Rocky Mountain and Pacific Coast regions of the United States is also undoubtedly true for the corresponding regions in Canada and likewise for the northern forests of the Dominion. It is owing to the fact that in Canada there has not been given the attention to these destroying agencies that their importance demands that so little information on the subject has been

acquired and their destructive powers are so little realised.

We are now endeavouring to obtain all the information possible as to the depredations of these bark beetles and other forest insects, in order to be able to investigate these destructive factors thoroughly. The Division of Entomology of the Federal Department of Agriculture has been strengthened by the appointment of Mr. J. M. Swaine, M.Sc., B.S.A., formerly lecturer in Entomology at Macdonald College, Que., as Assistant Entomologist, to devote his entire time to the study of forest insects. Mr. Swaine's extensive work and investigations on the bark beetles have made him one of the two chief authorities on these insects in North America, and he is now engaged in studying the distribution of the various species of bark beetles and their life-histories. A thorough investigation of their life-histories and habits is necessary, as it is upon the facts so ascertained that control measures are based. Different

species may be vulnerable at different periods of their life-history and at different times of the year.

There has been rather a tendency, unfortunately, on the part of practical lumbermen and foresters to doubt the practicability of measures of control for bark beetles, not to mention other forest insects. Practical demonstrations, however, are now convincing them that the trees can be treated for bark beetles and that large areas can be protected. Excellent demonstration work of this kind is being carried on in the United States by Dr. Hopkins in co-operation with the United States Forest Service, private owners and other bodies. In one locality in Montana 10,000 trees were treated in 1909 with the result that in 1910 instead of the former death rate of more than 10,000 trees annually, only 2,000 trees required treatment within an area of over one hundred square miles. This control work cost nothing, as the utilization of the treated trees for fuel and lumber more than repaid the cost of treatment. Reviewing the control work in the Rocky Mountain region, Dr. Howard states that since 1902 over 155,400 trees have been treated at an ultimate cost of \$31,211, 114,607 trees having been utilised so as to more than cover the cost of treatment, while 44,519 trees were treated at a direct expense of \$39,325. It is estimated that the timber saved as the direct result of this control work represents a stumpage value of over \$2,000,000. 'It is significant,' Dr. Howard says, 'of the practical nature of the methods of control recommended by the Bureau and of the practical demonstrations that have been carried on that no complaints of depredations have come to the Bureau during the year from the areas in Colorado and Montana, where control work was carried on in previous years according to the instructions of the Bureau.' To those who are impressed with the extent of the depredations of bark beetles in Canada the fol-

lowing reports of successful control work under forest conditions not dissimilar from our own are of course of great encouragement in the work before us of controlling these serious destructive agencies. The most important requisite now is the united support and co-operation of all who are concerned with the forests without which co-operation our work cannot succeed.

The following circular has been drawn up and is being sent to as many as possible of the persons who are engaged in forestry work in Canada. Mr. R. H. Campbell, Director of the Forestry Branch of the Department of the Interior, who is co-operating with the Division of Entomology in this work, is issuing this circular to all the officers of the Branch.

1. The Division of Entomology requests your assistance and cooperation in obtaining information upon the species of insects injurious to our forests. The extent of the damage caused by them, and other information valuable to their control. We wish to be supplied of any outbreaks of forest insects known to, or observed by, you, so that action may be taken at the earliest of the season of control measures adopted.

There have been for some years, and are at present, outbreaks of several outbreaks of destructive bark beetles in the United States forests. Much assistance goes to be expected in checking these at any time. We wish to obtain information, essential to obtaining a knowledge of their control, as rapidly as possible.

2. It is particularly important at the present time to obtain all information available upon the species and extent of the bark beetles. The following are types of insects to our Forest trees. Special efforts are also being made of other bark and wood-boring beetles and other insects, and your assistance in obtaining such material, as soon as the government and forest of such insects, will be very helpful.

The simplest method of collecting and shipping material is as follows: carefully collect all the bark, as much as possible, the beetles, and showing their houses and workings, by using paper and wrap in a box or in a wooden package. The material to be submitted to: The Forester, Entomologist, Central Experimental Farm, Ottawa, or sent to the nearest Forest Office.

(Circularized on page 40.)

Stations d'Observation et les Téléphones.

(Extrait du Rapport du Ministre des Terres et Forêts de la Province de Québec, 1911.)

La 'River Ouelle Lumber Company' rapporte que son service téléphonique a été constamment en usage et que cela a été extrêmement utile. Cette compagnie, vu probablement que ses concessions forestières occupent un terrain comparativement plat, trouve que le service téléphonique est plus pratique et plus utile que le système d'observation. Dans tous les cas cela lui donne satisfaction.

La compagnie Jno. Fenderson, qui a installé l'année dernière une bonne station d'observation, rapporte qu'elle en a obtenu de très bons résultats cette année.

La 'Charlemagne and Lac Ouareau Lumber Co.' a érigé un très bon poste d'observation sur la montagne du Lac Ouareau, et le rapport que fait le chef des gardes-feux de la compagnie est si clair que j'ai cru à propos d'en donner ci-dessous un résumé:

'Suivant des ordres reçus de monsieur A. MacLaurin, j'ai construit durant l'été que nous venons de passer, une station d'observation au sommet de la montagne du Lac Ouareau.

Le poste est situé sur le côté ouest de la baie, à l'extrémité sud du lac et à une élévation au-dessus du lac, de 800 pieds, d'après les calculs de l'honorable juge Fortin. Vers l'est on peut voir loin dans le comté de Berthier, au nord, à une grande distance qui n'a pas encore été déterminée, au sud et au sud-est on peut voir de l'autre côté du fleuve Saint-Laurent, et même, dans un temps clair, on peut distinguer la montagne de Belœil; à l'ouest on peut voir sur toute la largeur du comté de Terrebonne, en certains endroits la vue au nord-ouest est la moins étendue.

Le poste d'observation est divisé en sections, la partie inférieure est aménagée comme une habitation pour le garde résidant, les deux étages au-dessus sont des appartements, et en

haut la tour d'observation. Chaque étage a dix pieds de hauteur, la hauteur totale du poste est de 55 pieds, et la superstructure est disposée de manière qu'un homme peut monter sur le toit si c'est nécessaire. A la base les dimensions sont de 24 pieds carrés, montant en rétrécissant jusqu'à neuf pieds carrés. Toute la structure est solidée par des étais en cables d'acier, partant des coins au dernier étage. Un escalier relie chaque étage avec l'étage supérieur.

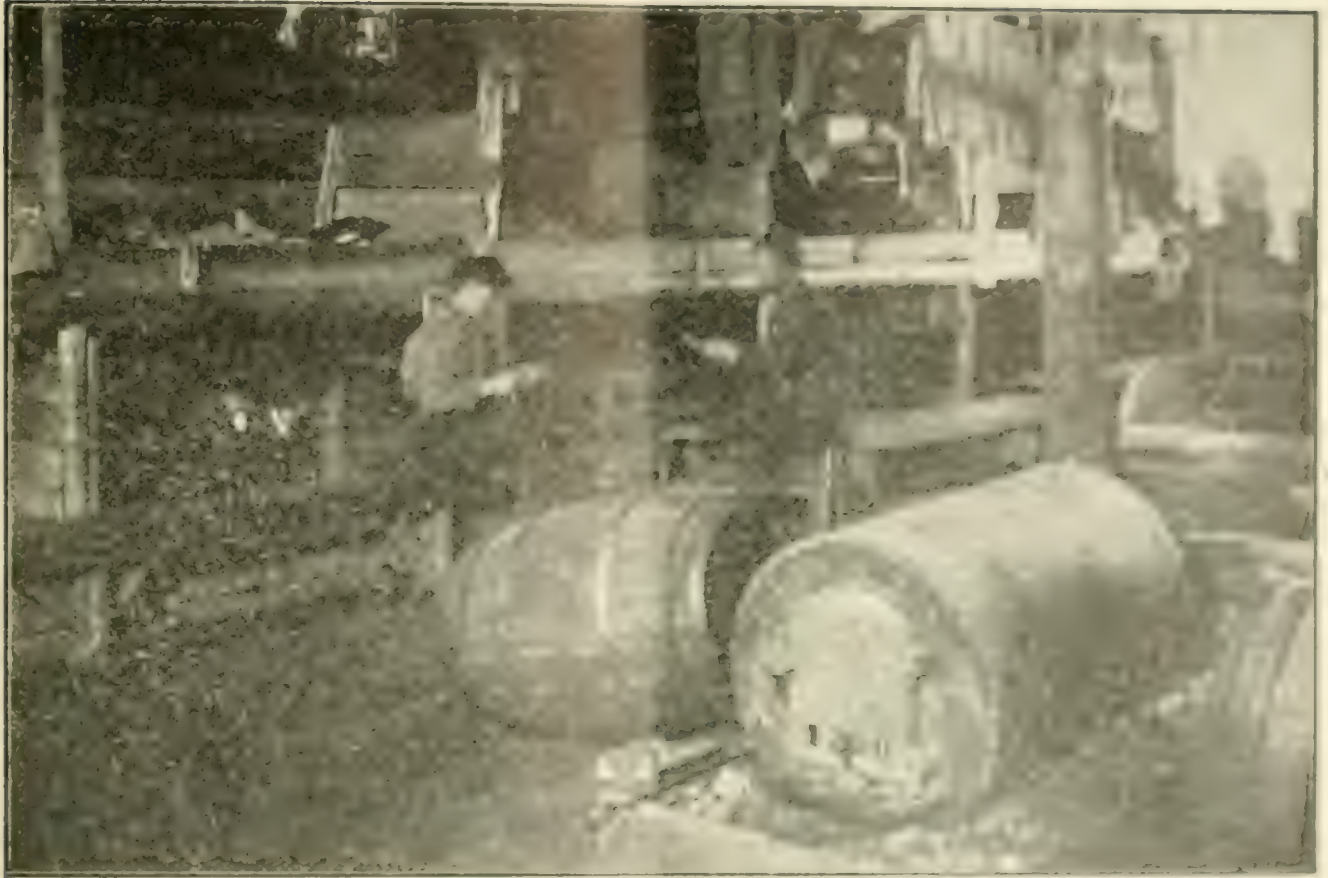
Un monsieur, de Welmington, Del., E. U. A., qui a visité le poste, disait qu'il n'avait jamais vu de point de vue comme celui que l'on peut avoir du haut de la bâtisse; qu'elle était admirablement située et que cela serait d'un grand avantage pour la protection des forêts.

Le poste est à environ un mille et demi du chemin principal, et l'appareil téléphonique qui doit le relier avec les centres est tout prêt à être installé; quand il sera en opération nous pourrons communiquer avec plusieurs points, entre autres, avec le bureau chef de la compagnie, à Montréal.

Je crois ne rien exagérer en disant que ce poste vaut quarante hommes stationnés comme doivent l'être nos gardes, et que l'on ne saurait trouver de meilleurs moyens de protéger les forêts qu'en construisant de ces stations d'observation partout où l'on peut en mettre dans les terrains boisés, car l'on peut ainsi indiquer aux hommes, par téléphone, le plus court chemin à prendre pour se rendre à un commencement d'incendie que l'on aurait aperçu du haut du poste.

Le poste est muni de table, compas, lunettes télescopiques, etc., et j'aimerais le voir inspecter par un officier du gouvernement.

(Signé) T. W. WAY.



Interior of a Lumberman's Camp.

Stumpage Prices in British Columbia.

By Roland D. Craig, F. E.

There are two ways of determining the value of stumpage: one is the price for which standing timber may be bought, and the other is the net profit that can be obtained after deducting the cost of logging and sawing from the price of the manufactured product, i. e., the lumber, shingles, etc. plus. The difference between these two values varies greatly, and in British Columbia there appears to be very little variation between the two.

Until about 1870, except for smalling timber in British Columbia, had practically no sale value. The Government gave the timber to anyone who was willing to pay the ground rent, and it was not to be expected that purchasers would pay much, if a bonus to private landholders when they could stake off their

themselves, but since the reservation by the Government of about 600,000 acres it had not, in 1870, the sale value has risen of the order of about 100 per cent. and more. By 1881 this great increase was not to be bought at from \$10 to 25 per M., which is now selling for from \$20 to \$3 per M. The average of the present value this year has been \$100 to \$150 per M. Not all is yet available to buy some of the best land comes on the province has it at a value of \$100.

In comparison with the value in other North American forests, British Columbia stumpage is not so unusually low. In the Pacific and the Northwestern States, the value is about from \$10 to \$20 per M., and in the West it is \$20 to \$40, and Washington values similar to that of British Columbia, only as a rule

not so accessible, at from \$2.50 to \$5 per M. The assessed value of the timber in the State of Washington averages \$2 per M, and this is always considerably below the sale value.

That these differences will be eliminated in the near future is certain. One of the chief reasons is that the supplies in the East are diminishing rapidly, and the centre of timber production is moving west. The cut of white pine in the United States has been reduced from 7,742,000,000 b.f. in 1900 to 3,900,000,000 b.f. in 1909; of hemlock, from 3,421,000,000 b.f. to 3,032,000,000 b.f., while that of Douglas fir has increased from 1,737,000,000 b.f. to 4,856,000,000 b.f. and Washington has jumped from sixth place to first as a lumber-producing state. Another reason is that so much of the British Columbia timber is located directly on protected arms of the sea, that logging operations and shipping can be carried on at all times of the year. The increased railway facilities furnished by the Grand Trunk Pacific and the Canadian Northern and the completion of the Panama canal, will remove a handicap which British Columbia has suffered in competing in eastern markets. Then, again, the size and quality of the British Columbia timber cannot be obtained elsewhere except in the Pacific States. The damp climate and broken topography of the country renders the fire risk less than it is with almost any other timber in North America.

From the standpoint of the investor, the tenure under which the bulk of the timber is held is very attractive. The owner may now hold the licenses in perpetuity, or as long as there is merchantable timber on them, or they are not required for agricultural purposes. Settlers are not allowed to homestead, purchase or squat on licensed lands, thereby eliminating one of the greatest sources of trouble and loss from

which Eastern Canadian lumbermen suffer. An annual ground rent of \$140 is charged for coast timber, \$115 for interior timber, and this amounts on the average to, approximately, one cent per M. The largest part of the taxation is reserved until the timber is cut, as it should be. This gives the Government an interest in the timber to the extent of 50c per M, and is a great stimulus to Government co-operation in forest protection. This reservation of the 50c royalty is practically a loan to the investor of that amount of money without interest for an unlimited time. On an average stand of 20 M per acre, this loan amounts to \$10 per acre, and the interest saved to the investor at 6 per cent is 60c per acre, or about three times as much as the ground rent. The lumbermen of Washington are trying to have their taxation arranged in this way, on the ground that high annual taxation forces early and wasteful logging.

The only practical way of studying stumpage values, however, is by comparing the net values after deducting the cost of manufacture from the prices of lumber. This may be called the absolute stumpage value. Canadian data on this point have not been collected, but in Bulletin 122 of the U. S. Forest Service the report of a careful investigation of prices between the years 1899 and 1906 is given. In spite of the increased efficiency of logging machinery, there is no doubt that the cost of labor is increasing, and the timber logged is less accessible, so that \$2 to \$2.25 should be allowed for increased cost of manufacture during that time. It was found that the average mill value of fir increased from \$8.67 per M in 1899 to \$14.20 per M in 1906, which, after deducting \$2 for increased cost of manufacture, shows a net increase of \$3.53, or an average of 50c per annum. Cedars increased in the same time from \$11.68 to \$19.27 per

And, allowing \$2.25 for increased cost of manufacture, there is left a net increase of \$5.34, or 76c per annum. It is confidently expected that the census of 1910 will show that the same rate of increase has been maintained.

In predicting the future, the chief guides are past experience, supply and demand.

Canada and the United States are so interdependent that what affects the one must affect the other, and we must consider the increasing demand which the Republic is bound to make on us. It is estimated that at the present rate of cutting (about one hundred billion feet, including all forest products) the United States has sufficient wood to last only twenty-five years, and, according to the estimate of the Hon. Clifford Sifton, we have in Canada only 500 billion feet, or enough to supply that demand for five years. Further exploration may, in the opinion of the writer, bring this estimate up to about 700 billion feet.

Of this amount about 300 billion feet is in British Columbia.

With the rapid growth of population and development of industries, the consumption of wood is increasing rapidly. The increase in the cut of 1909 over that of 1900 in the United States was 27 per cent. It is estimated that less than one third of the consumption is being replaced by new growth, so that we must expect to be called upon to supply an increasing demand. Not only do we have to consider the demand in the home and the United States markets, but our lumber trade with Australia, the Orient, and Europe is each year assuming larger proportions.

The only inference is that stumpage values must continue to rise, and that British Columbia timber, which is so exceptionally well situated to supply the markets of the world and is at the same time the cheapest to buy and carry, offers an unparalleled opportunity for investment.



Booms of Logs.

Tree Planting in Southern Alberta.

By A. Mitchell.

Of all the prairie provinces, Alberta has the greatest variety of climate; and it is well worth the while of anyone who contemplates planting to endeavor to get a thorough understanding of the particular set of conditions which will apply to his locality. The thorough preparation of the land previous to planting is necessary everywhere, as in the other prairie provinces, and so, too, is the after cultivation; only, in southern Alberta, with a somewhat lesser rainfall and more dry winds, there is a greater need to conserve the moisture, and consequently the value of cultivation at the right time is more apparent. The kinds of trees suitable vary in the several districts, and when a man is planting it will pay him well to plant only what is likely to succeed.

The 'Chinooks.'

The warm Chinook winds coming over the mountains from British Columbia are the cause of many a pleasant gap amid the rigors of winter, and they have been blamed for a great deal of tree-killing they never were guilty of. The trouble usually arises from faulty cultivation. The influence of the Chinooks is usually considered to extend from the boundary line to a distance of about fifty miles north of Calgary. North of this, the winters are steady and differ little, if at all, from those of the other prairie provinces.

The rainfall in the Chinook country is, as a rule, a good deal less than it is in the north, and ranges from about thirteen and a half to nearly eighteen inches. North of the Chinook belt the precipitation runs from eighteen inches up to as high as twenty-seven inches in some years, and, as a great part of the country is bush, a set of conditions prevails which differs very much from that met with in the south.

The Chinooks have been blamed for doing damage to trees in this part of the country by inducing an untimely flow of sap in the late winter or early spring, which, when followed by a sudden drop of the temperature immediately afterwards, ends in disaster to the trees. This may be true, but the writer has never seen it. What looks like it, and is often mistaken for it, is the fact that sometimes the buds swell toward spring, but advance no further, and the branches bearing them die, because there was not, at the roots of the tree, moisture enough to enable them to supply what was necessary to keep up the growth. It is only a question of

moisture, and where trees are irrigated properly or cultivated thoroughly, there is never any trouble from this source, and in the Chinook country, as in all the rest of the prairie, it will be found that the man who cultivates best in the summer is the one whose trees best survive the winter. This has been proved over and over again.

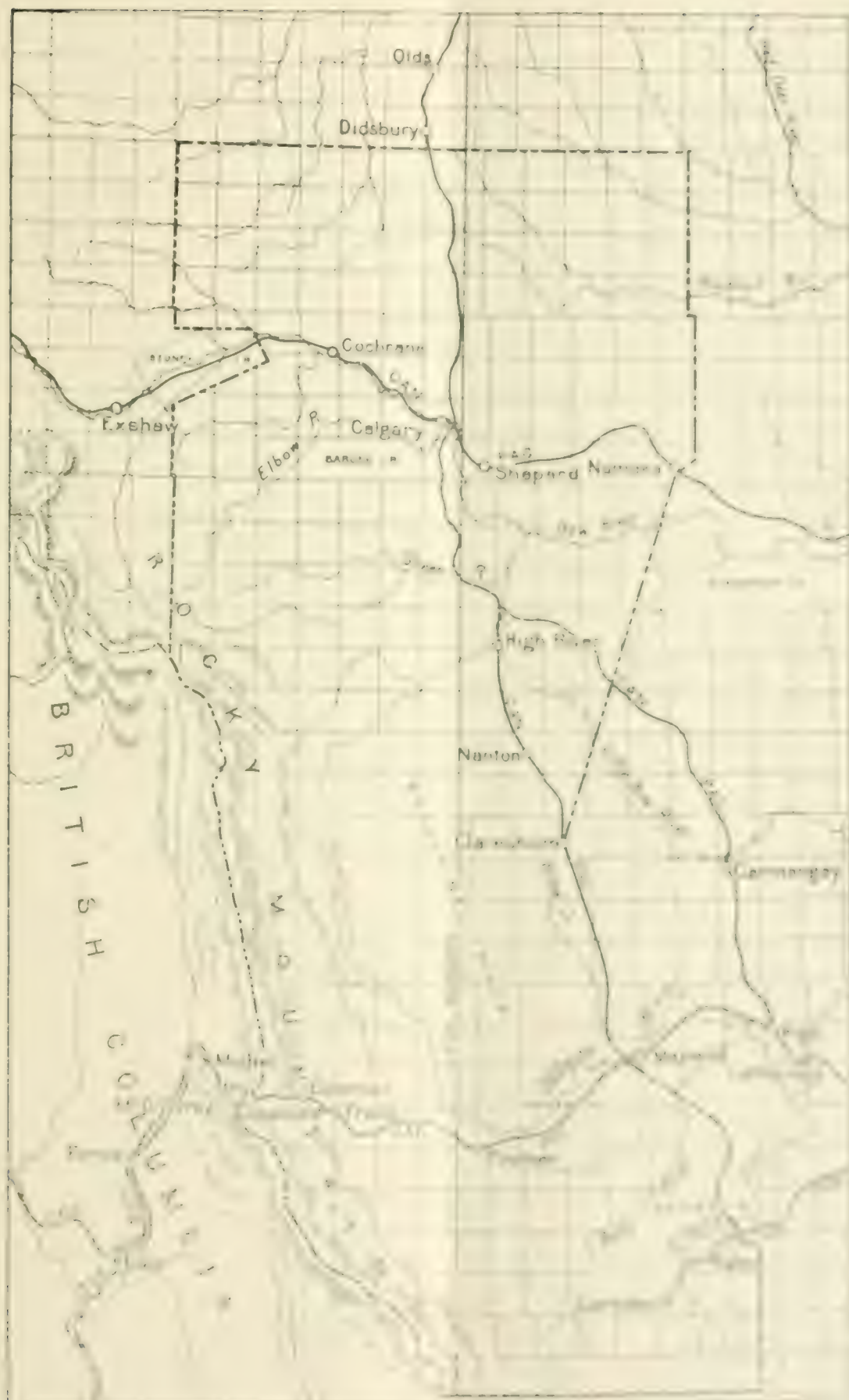
The 'Higher District.'

But the Chinook is not the only thing that influences the climate of southern Alberta. Another feature bears very materially on this subject, especially in relation to tree-growing, and that is the rapid slope upward as you approach the mountains. From Medicine Hat, at a height of about 2,171 feet above sea level, to Calgary (only about 150 miles west) there is a rise of 1,257 ft., and from Macleod westward the rise is even more rapid, for the altitude of that town is about 3,208 feet, while Pincher Creek (only thirty miles further west) is some 600 feet higher. Conditions like these cannot fail to have an influence on the climate, and not infrequently these higher regions are visited by a touch of frost several weeks earlier than the country further east.

This 'higher district' of the province may be defined as lying from the boundary line north to about Olds, a distance of some 200 miles; and includes all the country west and south of Spring Coulee, Pincher Creek district, west and south of the Piegan reserve, the Porcupine Hills, and west of a line from Staveley on the Calgary-Macleod line, running NNE, to Namaka on the main line of the C.P.R.; thence west of a line between ranges twenty-three and twenty-four till the bush country is reached.

All the country included in this area may be classed as the 'high country' from an arboricultural point of view, and it will be found that trees which do quite well further east do not always succeed here.

The sudden rise from the Pacific, as is well known, causes the moisture-laden breezes from the ocean to lose their moisture almost entirely as they come over the mountains; so that the western slope is very wet, while east of the Rockies the rainfall is very small. Not all of the rain-clouds are deposited on the western slope, however, for frequently during the summer the skirt of a cloud may be seen coming over the summit to fall in rain on the higher prairie and the foothills, which are in this way usually blessed with a considerably better rainfall than the flat country further east. (The prairie



Map of the Higher District, Alberta.

The Indian line marks the boundary of the Indian Reserve.

rains, unless in the case of thunderstorms, are almost always from the north.)

From an agricultural point of view all these matters are important, and farmers in the different localities are rapidly learning to meet the local conditions; but they are far more important from the point of view of the silviculturist, for the farmer may change his methods every year to suit the seasons, but when a man plants a tree it may be years before he finds out if it is really adapted to the locality. If the occasional showers are continued until late in the season, tree growth is carried on correspondingly late into the fall, and if the first fall frost happens to be a little early, then the young tree-shoots get badly frozen, and the owner of the plantation is badly disappointed. Add to this the fact that, in the passing of the centuries, there has been added to the soil a goodly layer of humus from the decay of the grasses, which naturally took on a greater growth as a result of the additional rainfall. Humus encourages rank growth; rank growth is usually late growth, and there is an additional risk of the young tree-shoots being unprepared for the winter, and the consequent danger of being hurt by the early frosts. Thus it is that the very richness of the soil may be an adverse condition to growing trees, and in the 'higher regions' many of the trees so successfully grown further out on the prairie are found to be quite unsuitable. When this 'autumn killing' occurs several years in succession, the would-be tree-grower gets discouraged, and small wonder if he sometimes even gives up his attempts in despair.

The Ash and the Elm.

The ash, the hardiest of the trees used in the plantations on the prairie, in this region very seldom commences its growth from the terminal bud of the previous year, and as a consequence it develops a habit more resembling a sweeping-broom than anything else.

The elm is somewhat similar, and, like the ash, is not at all suitable for general planting; while the maple always loses from a few inches to several feet of its growth every year, and becomes a veritable bush. The cottonwood, notorious for its soft succulent growth, is perhaps the greatest sufferer, and in a few of the plantations in the region specified it is nothing better than a bunch of root-shoots, half of which are dead, and in one case, some years ago, trees seven to eight feet high were killed outright, root and branch.

This is perhaps not to be wondered at when one comes to remember that none of these varieties are native to the region under consideration. They are found in the river bottoms all over the prairie to the east, but they never seem to have been able to climb the last sharp rise towards the mountains. The ash comes no further west than the

Cypress Hills, south of Maple Creek, while the cottonwood and maple are found no further than a few miles west of Lethbridge.

The Poplar and the Willow.

Two Russian varieties have, however, been found doing well in this district, and there is no reason why anyone should hesitate about planting on account of trees being likely to suffer from frost-hurt. These are the sharp-leaved willow (*Salix acutifolia*), and one of the poplars (*Populus Petrofski*). The willow is doing well on the high land near Cardston, and in the Porcupine Hills west of Staveley, at the Oxley ranche, are several good specimens of both willow and poplar twenty-four feet high and about sixteen years old.

There is also a fine seven-year-old plantation with Russian poplars about thirteen miles east of Didsbury, and it is very interesting to note the contrast between them and the cottonwood in the next row beside them. The poplars are from twelve to sixteen feet high, sound to the tips,—and have to all appearance begun each year's growth from the terminal bud of the year before, while the cottonwoods are bushy from repeated freezings, and half of the stems composing the bushes are dead. The tallest is only about seven and a half feet. The difference in the two kinds of trees will not be wondered at when it is remembered that the Russian poplar matures about two weeks earlier than the cottonwood. There is also a plantation with a fine lot of Russian poplars about ten miles east of Calgary and four miles southeast of Shepard, which is beginning to make its appearance over the intervening ridges as one comes up on the C.P.R.

The Russian poplar is not the most desirable tree for general planting, as its roots have a tendency to throw up suckers, and it may in time become very objectionable from this cause; but in a treeless country it is better to have a tree that suckers and will grow and make a rapid shelter than one that is continually freezing back. If the Russian poplar is placed well towards the inside of the plantation, there need be little trouble from suckering in cultivated land adjoining, or it may be planted in narrower belts where the land is not intended to be cropped. Another objectionable feature about the Russian poplar is its tendency to contract stem-canker, and the variety with the erect branches and leaves with wavy edges (probably *Populus certinensis*) is particularly unfortunate in this respect. *Populus Petrofski* and *Populus Wobstii*, with spreading branches and thick leaves, are pretty free from trouble of this sort, and they are good sound trees in the older plantations at the Indian Head and Brandon Experimental Farms.

When the tree is left alone for nature to prune, there would seem to be little danger of this sort of trouble; but when a man

gets impatient to see a clean stem and cuts off the lower branches, that tree very frequently becomes cankered. In most cases it is best to leave well alone and let nature remove the branches and develop a clean hole in her own way.

Mixing the Trees.

Although maple (*Acer Negundo*), American elm and green ash are not the success in the higher districts of Alberta that they are further east, it does not follow that they should be left out entirely from the plantations. They are very good trees, and, as hardwood timber is very useful on the farms, it will always be worth while planting a few in with the others. As the plantation grows up and affords them the necessary shelter, they will no doubt ultimately succeed and become fair sized trees. Maple, especially, should always be included in a plantation, even in the higher districts of Alberta, for it furnishes the soil shade so necessary for good growth.

In examining some plantations recently in this district, the writer found its soil shading advantages brought out very well in several places. Timothy seed had blown in from the neighboring hay-fields and in every case, where the maple was in its normal bushiness, the grass had made no headway, but was choked out by the shading of the trees; while all around, among the elm, ash and cottonwood, it was quite flourishing.

A good mixture for the high country would be, in a plantation of fifteen rows wide, i.e., 22 yds., M.M.W.M.RP.M.RP.M.RP.M.W.M.W.M.M. Every sixth tree of the maple rows would be ash or elm. In this mixture there would be ample provision for soil shade and a ton of the most valuable ash and elm would be introduced so that they might by-and-by work their way up as they forced themselves sheltered by the other trees. The Russian poplar would be well inside the plantation and away from any danger of suckering in the adjoining land.

Preparations for Planting.

The question of water supply is the real axis of the situation in regard to tree growing, as it is in all other crops on the prairie, and in southern Alberta, with such a low rainfall, its consideration is of first importance.

This makes necessary the preparation of the soil previous to planting by breaking and back-setting and thorough fall-working on raw soil land, or winter plowing on stubble. This preparation pulls the soil, returning it to a fine tilth so that it will hold the maximum of moisture over to the following year when the trees are planted.

The time for breaking is important, and the best time for breaking may be defined as being in the 'flush of the growing season,' i.e., from about the middle to the end of

May. Soil, when turned over at this time, rots readily, but it must be laid flat and it will pay even to run a roller over it in order to lay it right down.

It should not be disked immediately after breaking. This is a practice which may be all very well for winter wheat, but it makes a very poor preparation for trees. About six weeks after the soil is broken it should be quite well rotted and should be back-set, and the plow should run about two inches deeper than the breaking. The soil thus broken up should at once be disked and worked up, and, as soon as it is worked, back-set. Leaving it even for a day allows the escape of far too much moisture and it is much more difficult to work afterwards. A deep plowing and further working in the fall will leave it in the shape for taking trees in the spring.

Keep Out the Grass.

When back setting is left longer than six weeks, the little spears of perennial grass roots which may be unfettered get a chance to grow, and later on will cause a lot of extra work in the plantation. If any of these little grass patches do appear among the trees, it will always pay well to fork them right out and destroy them. They are not deep, only about four inches, but a cultivator or a hoe is of no use in dealing with them. A fork or a spade is the only sure cure, and half a day spent the first season after planting will often be time well spent.

Summer-Fallow.

Summer-fallow should be done at the proper time. If this is not done, the proper function of summer-fallow is not taken advantage of, and, instead of giving the soil a better bottom and heat, the soil gets so dry and hard with consequent detriment to the growth following. Some men still hold the idea that summer-fallow means allowing the weeds to grow and then plowing them under for a green crop to enrich the soil. That was the method once followed further west, and it is hard to get up there to understand any more different. They allow the weeds to set up all the moisture in the soil, and are surprised by finding up the next year crops so dry that summer-fallow. They would not be surprised, for there is very little growth in the soil to give plants food, when that has already been used up in plowing the weeds, there is none left for setting them. Summer-fallow in the west is for several reasons. Weeds, etc., are removed, moisture in the ground, and right so far, but the main object is to rest the soil before the future plant growth. The plowing should be done about the beginning of June, and the land packed and harrowed the same day if it is possible. A roller must work the soil in the same way as we do, except preparation for summer-fallow, for the harrowing of the surface will help to

keep the moisture from escaping. Cultivation during the summer to loosen the surface soil and destroy weeds must always be done.

Cultivation of the Trees.

After the trees are planted, they should at once be cultivated to loosen the soil and keep in the moisture. This is a matter that is often neglected and the trees suffer. It does not take long to do, and it pays well, for often one finds a plantation doing probably well enough, but not nearly so well as that of a neighbor's under precisely similar conditions, even to the number of times the cultivator was used, the only difference between them being that one was cultivated at the right time and the other was not.

In Other Parts of Alberta.

With the country to the east—the 'dry-farming' country—there need be no difficulty about tree-growing, for the same methods of preparation and treatment found so successful in Saskatchewan and Manitoba are just as successful here, and there is no more risk of damage from frost-hurt (indeed, probably less) than in some of the districts toward the north of these two provinces.

The growing of trees in the other parts of Alberta (i.e., north and east of the Chinook country) does not differ materially from what has been said about the south. The winters are steady and the drying effects of the winds are not so apparent, but the same cultivation and preparation previous to planting are just as necessary as farther south.

Arranging the Plantation.

The best way to arrange the plantations would be to plant, say, three belts, running north and south across the farm, one on the extreme west, and the other two one-third and two-thirds of the way across, respectively. These would soon furnish shelter enough for all purposes, and when such a movement comes to be universally taken up, there will be quite a change in the appearance of Alberta's prairies, as well as in some of the climatic conditions of the country. An alternative arrangement would be to plant similar belts all around the fields, but, as the prevailing winds in Southern Alberta are from the west southwest, probably the north and south strips would be best.

In order that they may be established and maintained economically, the plantations would require to be about twenty-two yards wide and the trees three feet apart. This seems close planting, but it would mean at least one year less cultivating—a matter of some importance to a busy farmer. Trees at three feet apart usually require only two years cultivation, while those at four feet take three years and sometimes more.

The cost need not be excessive. A few thousand cuttings of Russian poplar and willow and a thousand cottonwood trees (these to be used as a supply nursery from which to get cuttings for the plantations) and about two thousand maple, ash and elm seedlings every year would be sufficient to plant an acre, at 4,840 trees to the acre.

Planting can be done at the rate of one thousand trees per day per man, working with a spade, so that two men could finish an acre in about two and a half days. The poplars, cottonwoods and willows would speedily reach a good height and furnish a great deal of shelter, which could not fail to benefit the land to the eastward of them, while the maples would maintain the necessary ground shade and incidentally develop into poles.

Tree-planting has a great future in Alberta. It is a country of very recent settlement and there is consequently very little soil drift at present. But it is also a country of much wind—much worse than its neighbors to the east—and in a very few years the farmers of Alberta will be face to face with the problem many of the farmers of Saskatchewan are facing now, viz., 'How to prevent the drifting of the soil', only in a more accentuated form. The growing of winter wheat will help to some extent, but the only sure and safe way is for each farmer to protect his own farm by planting trees.

This wholesale planting may appear a little premature, but it is not. No one will question the need of it and we know now what trees will grow and the best way to set about growing them. There are plenty of farmers now in the country prosperous enough to stand the little extra time necessary to prepare and maintain an acre or two of trees. If such plantations are ever undertaken (and they will be some day) they must just be figured on as part of the year's work on the farm, and attended to systematically like everything else; otherwise they had far better be left alone.

Three four-rod belts across the fields would come to about twelve acres per quarter-section, and a plantation of similar width all around would be sixteen acres—not a very large area, and certainly not too much if the country is to have its proper complement of trees. Such plantations would answer, to some extent, the fuel question, which is just as likely, in some hard winter in the future, to become acute as it has in past seasons of that character. Moreover, if mixed farming is to become the system followed in the west (and no one can doubt that it will come sooner or later) such belts of trees will be of the greatest use in sheltering the stock. Work for the hired men in the winter, too, is a pressing problem which the thinning of the woods and the cutting up of the cordwood will help to solve in the years to come.

Summary.

The owner of such a plantation need not feel greatly disappointed if the Manitoba maple is killed back repeatedly and becomes a mere bush. It is intended to shade the ground in the plantation in order that the better trees will grow rapidly. It is in the plantations for this purpose, and will do it quite as well as a bush. Try and try the more rapid growing trees will shelter it and give it a chance.

Remember that proper previous preparation is half way to success, and it means far less work later on.

Break in the flush of the growing season. Always back-set sod, and never leave it over six weeks after it is broken.

The 'blue-joint' should never be allowed to spread in from the root of the poles at the plantation.

In the Chinook country as everywhere else, the trees that are cultivated best come down through the winter.

Investigations on Forest Insects, etc.

Continued from page 773

Specimens of adult larvae, with the wood in which they have worked, are of great value to us, if the locality of collection is given. ADULT LARVAE are killed in a vial of alcohol or in a vial

3. Indeed, there are few personal calls in Burke's work as there should be. In Britain, we should be glad to read readable letters, with wit, to discuss nothing but make suggestions as they were sent, both as grateful for authorial support as well good and convenient fashion, with more as ability, date and local events.

It is hoped that associations and private individuals will co-operate with the Division of Entomology, and, by so doing, assist in the work of forest protection, which of all aspects of forestry is the most important.

When that was made, the storm grew
And lasted six weary hours;
Had rain very good, great good too,
And heaved and rolled and raved
To man his soul. "So this I guess
You ladies heard and saw;
Now if you'll be good, I'll say
To make it be the same."

"All houses are made of straw, if we must
 build houses, let's build ourselves some
 My friends, many years since we were, and always
 How little I've achieved here!
 I look back often, sometimes too fond,
 To the beginning of the journey;
 Those dangerous, yet so lovely, roads
 And those My self as wanderer!"

When thou wast passing this wayward, ill
 Fair Devil did he say
 Let Children cry and old men
 And Spanish dogs cry
 His voice stopped, he was agitated,
 In terror of his weakness,
 The greatest was his weakness,
 In every word he said.

Canadian Pulp Woods.

The Species Useful for Paper Manufacture and their Qualities.

By Judson A. DeCew, Chemical Engineer.

The classification of certain species of timber as pulpwood, in contradistinction to other kinds of wood, is but an arbitrary nomenclature based upon the commercial application of these particular woods in the paper trade.

The pulp woods of North America are quite distinct species from those in common use in Europe, and were it not for the more or less free interchange of these products on this continent, these distinctions might eventually develop with us. Since the increased necessity for a more economical use of available woods has forced investigations, resourceful workers have evolved methods for converting practically any kind of wood into good pulp and paper. The problem resolves itself into one of total cost, the cost of wood and the cost of conversion being variables for each species of wood used.

Since the spruce woods have proven to be the best adapted for the manufacture of a good paper at the least cost, these woods have become the standard from which all others are judged, and have become invested with such values as the best raw material always brings. The use of the other woods for making pulp is a matter of trade knowledge rather than public recognition, although the practice of the future in this regard will likely alter the popular viewpoint.

There are a number of woods which from their properties and use may be easily classed as pulp-woods, a goodly portion of these being inhabitants of Eastern Canada, while others are found only in the Far West.

EASTERN WOODS.

White Spruce—*Picea canadensis*.
Black Spruce—*Picea mariana*.
Balsam Fir—*Abies balsamea*.
Hemlock—*Tsuga canadensis*.
Jack Pine—*Pinus Banksiana*.
Poplar—*Populus tremuloides*.
Balm of Gilead—*Populus balsamifera*.
White Birch—*Betula populifolia*.
Canoe Birch—*Betula alba*, var. *papyrifera*.

WESTERN WOODS.

Engelmann (White) Spruce—*Picea Engelmannii*.
Sitka (Tideland) Spruce—*Picea sitchensis*.
Western Hemlock—*Tsuga heterophylla*.
White (Balsam) Fir—*Abies concolor*.
Lowland (White) Fir—*Abies grandis*.
Amabilis (Red) Fir—*Abies amabilis*.

Bull Pine—*Pinus ponderosa*.

In studying these woods in their relationship to paper making, let us first consider those properties which make the spruce wood so suitable for this purpose.

Eastern Conifers.

The white spruce, *Picea canadensis*, which is the most important tree north of the 60th degree of latitude, is somewhat larger in size than its near relative, the black spruce. Its wood is light, soft, straight-grained and satiny. The bands of summer cells are thin and the resin passages few. The color of the heart and sap is hardly distinguishable. The resin content may vary from 0.2 to 0.4 per cent. The specific gravity is 0.4051 and ash 0.32. In this wood the structure of the spring and summer growth is more uniform than in most of the coniferous woods, the fibres are long and regular, and therefore it is found to grind easily, giving a pulp of light yellow color and a fibre that readily forms in a sheet of paper.

The black spruce, *Picea mariana*, generally occurs with the white spruce, and its wood is very similar in character and structure, although the summer cells are more resinous and there are fewer medullary rays. The color of the wood is from light red to white, the specific gravity is 0.4584, the ash 0.27, and the resin from 0.3 to 0.5 per cent. It is noticeable that the black spruce is heavier than the white spruce, and the yield of pulp from it is therefore proportionately larger.

The Balsam Fir, *Abies balsamea*, is found with the spruces above described and is used in greater or less quantities, mixed with the spruce pulp wood of commerce. The only noticeable difference in its character from the above, is the fact that it is lighter in weight, slightly more coarse-grained and a little more resinous. Specific gravity 0.3819, ash 0.45. When ground a somewhat smaller yield is obtained, and the pulp is a little rougher in its character.

Hemlock, *Tsuga canadensis*. This wood is found in greatest abundance in Canada, although it occurs also in Michigan, Wisconsin and in the Alleghany mountains. Its wood is soft, not strong, brittle, coarse and non-resinous. It shows broad summer bands, and the color varies from light brown to white. Its specific gravity is 0.4239 and ash 0.46. The resin content is very low, being about 0.2 per cent. Chiefly owing to its color and large sum-

mer bands, it is much less suitable for ground wood than spruce or balsam. Owing to its non-resinous character, it is quite suitable for the production of sulphite fibre. The heartwood fibre is larger and coarser than the spruce, and when the wood is more lignified there is a lower percentage yield of cellulose.

Jack Pine, *Pinus Banksiana*. This is a species of conifer which should be of importance in pulpmaking, for there are very large quantities growing in some districts, and the tree is really too good to be of much importance for lumber. The wood, which is locally called Jack Pine, presents some important technical difficulties in its use, but it will no doubt in the near future be successfully utilized. The wood is light, soft and rather close grained. The secondary rays are numerous, and these are generally very much in evidence in any low grade sulphite made from this wood. In comparison with other pulp woods, this wood is very resinous, the resin content probably averaging about 2 per cent. The heart is light brown in color and the sap white. Specific gravity, 0.4701 and 0.23. This wood is now being used to some extent for railway sleepers and pulp, there being no insurmountable objections to its use in pulp making, when proper working processes are employed. The fibre of the jack pine resembles the hemlock in structure, but the wood is of softer nature, although heavier in weight. Amongst pulp woods, therefore, these two woods, with some others of similar character, might easily be placed in a class by themselves, a second grade.

Hardwoods Used for Pulp.

Amongst the broad-leaved trees are here the poplar and white birch, which are destined to take a place of considerable importance in the manufacture of pulp.

Poplar, or aspen, *Populus tremuloides*. This is the most widely distributed North American tree and it occurs in almost any place where virgin timber is being replaced by a younger growth. It is a small tree, barely large enough for lumber, and its wood is light, soft, close-grained and compact. The color of the heart is a light brown, but it has a resinous sapwood which is mostly white. The wood is also non-resinous and its specific gravity is 0.4602, while its ash is 0.52.

Balm of Gilead, *Populus balsamifera*. This is an allied species to the poplar, common along the shores of southern rivers. It is a large tree, but the fibre and the characteristics of the wood are quite similar to that of the poplar. The fibre in both of these woods is short, being about one-half the length of the spruce, and this is the factor which explains largely the use of these pulp woods. The balm, however, is a lighter wood than the

poplar, since it has a specific gravity of 0.4087, its ash being 0.60.

Of the three, *Populus tremuloides* is the most Allied species, most of which is quite suitable for making pulp.

The White Birch, *Betula papyrifera*. This is a short lived tree of rapid growth, which sometimes reaches a diameter of one foot. It grows with the poplar or immediately behind it in the same forest. The wood is soft, light, close-grained and not resinous. The color of the heart is light brown, but the sap is mostly white, the resinous resin being the larger percentage of resin being the best adapted for pulp. The specific gravity of this wood is 0.3701 and its ash 0.50 per cent.

The Paper Birch, *Betula piceolata*. This is a very white, straight tree throughout the whole of Canada. It is very common in the northern Atlantic region and grows further north than any other deciduous tree. The wood is light, hard, non-resinous and close grained. The heart has a brownish tinge, but the sap is white. Specific gravity, 0.4101, and 0.25 per cent.

The fibre of the white birch is not slightly longer than the poplar, and they can be used to great advantage along with it or replacing it. Being about 16 in per cent. heavier than poplar, however, they are more difficult to bring from the forest, as they are very heavy when green and do not float well. The relative advantage in pulp per cord, however, is one that should fully compensate for the extra cost of moving these woods.

Western Conifers.

Lagimodendron, or White Spruce, *Picea lagimodendron*. This wood is found chiefly in the central Rocky Mountain region and the West Coast of Canada. In this locality it forms extensive forests, an extension of over 1,000 feet, and grows to be a large tree, some of enormous height. The wood is soft, heavy, and with a close, straight grain. Like the eastern white spruce, the western birch, the red spruce, and the white spruce, the wood is not easily distinguished from the rest. The wood is lighter in weight than the eastern white spruce, for its specific gravity is but 0.3410, and its color of pulp will show that the tree is of the poplar type. The ash is 0.52.

Stipa, or Sitka Spruce, *Picea sitchensis*. This tree is found in British Columbia, north of the coast of the coast, and grows to a large size, sometimes 100 feet in diameter. The wood is soft, with a close, straight grain, the heart being of a light brown color, but the sap is white. The wood is found in many of the western black spruce, the specific gravity 0.4087. The ash is 0.52. The fibre of this birch is about 16 in per cent. longer than the

eastern spruce. The maximum length would be about 6.7 mm. as against 5 mm. in the eastern species. The cellulose made from this wood should be very desirable for the manufacture of strong papers, providing it is not weakened in the process of conversion.

Western Hemlock, *Tsuga heterophylla*. This wood is found in British Columbia and the Pacific States, growing along with the other large trees of the country. It is somewhat heavier, harder and darker than the spruce, but it is superior in many ways to the Eastern Hemlock. This wood can be satisfactorily ground, but owing to the blackness occurring in some trees, its average color would be a disadvantage. It is non-resinous in character, however, and well adapted for the manufacture of sulphite fibre.

White, or Balsam, Fir, *Abies concolor*. This is used with the spruce for sulphite and ground wood, but, like the eastern woods, the balsam is the more resinous. Its wood is soft, coarse-grained, and compact. The summer bands are narrow and the color is from light brown to white. The gravity is 0.3638 and the ash 0.85 per cent. The fibre is almost as long as the tideland spruce.

Lowland, or white, Fir, *Abies grandis*. This is a large tree found all along the Pacific slope. It is hardly suitable for ground wood except in young trees, and then the resin content is a disadvantage. Owing to the broader summer bands, it is harder than the other woods described, but it has a long strong fibre, and will make excellent cellulose by any alkaline process.

Amabilis, or Red, Fir, *Abies amabilis*. This is another species of fir, which is found in the valleys of the Fraser and Columbia, and on the mountain sides. In the valleys it is a fairly large tree, but on the hillsides, it exists very largely as a scrub, with a very close-ringed growth. This scrub growth is very little use for anything except pulp, for a tree from 50 to 60 years old would have a diameter of about 6 inches. It contains about 1 per cent. of resin, which is about the same as the species of black spruce, which also grows as scrub in these mountain regions. The specific gravity is 0.4228 and ash 0.23. The color is not too dark for ground wood, and some day it will probably be used for that purpose, although it is rather too resinous for present requirements.

In the interior of British Columbia, there is another species of pine called the Bull Pine, *Pinus ponderosa*, which is a wood quite variable in character. This wood is supposed to be very resinous, but an average sample examined by the writer, was found to contain but 0.67 per cent. of resin, which is quite within the workable

limit. As scrub this is a faster-growing wood than the spruce, and it is somewhat surprising that it should be heavier in weight. The specific gravity of this wood will average 0.4715, and the ash 0.35.

To those interested in the study of woods from either their scientific or commercial aspect, it is a well recognized fact, that any species having a wide distribution, will, when growing under different influences of climate, soil, altitude, etc., show a considerable variation in its structure and physical characters. Any fixed data, therefore, although it may represent the results of a number of observations, can only be taken as a basis from which other specimens may be judged.

In the above descriptions it has been the writer's endeavor to show from the properties of the various woods, those attributes which are essential in any wood for the present requirements of pulp making.

The conditions of growth in a northern country seem to be best adapted for the development of those species which have a soft and non-resinous wood. Naturally these woods will be exploited and used in the production of pulp and paper, until the costs of working from this source are such as to allow the profitable working of the cheaper but more resistant woods.

The Brown-tail Moth in Canada.

The history of the Brown-tail Moth in Canada is briefly as follows:..

1902. Mr. Wm. McIntosh, of St. John, New Brunswick, took a single male specimen about twenty miles from St. John, N. B. Mr. G. Leavitt also took one.

1905. In July, Mr. John Russell took a specimen of the moth at Digby, Nova Scotia.

1907. A single winter web was received by the Division from Mr. C. P. Foote, Lakeville, King's County, Nova Scotia. Immediate investigation revealed the presence of several thousand webs in Annapolis and King's Counties.

1909. Winter webs containing living caterpillars were found in shipments of seedling nursery stock imported into Ontario, Quebec, and British Columbia, from France, as a result of the inspection of these shipments.

1910. A single egg mass received in August from St. Stephen, New Brunswick.

1911. Winter webs discovered at Pomeroy Ridge, Charlotte County, N.B., being conclusive evidence of the establishment of the insect in New Brunswick. The infestation in Nova Scotia also discovered to be greater.

—Report of Dominion Entomologist for 1911.

Value to a Farm of a Woodlot.

(Wm. F. Payne, in Farm and Dairy.)

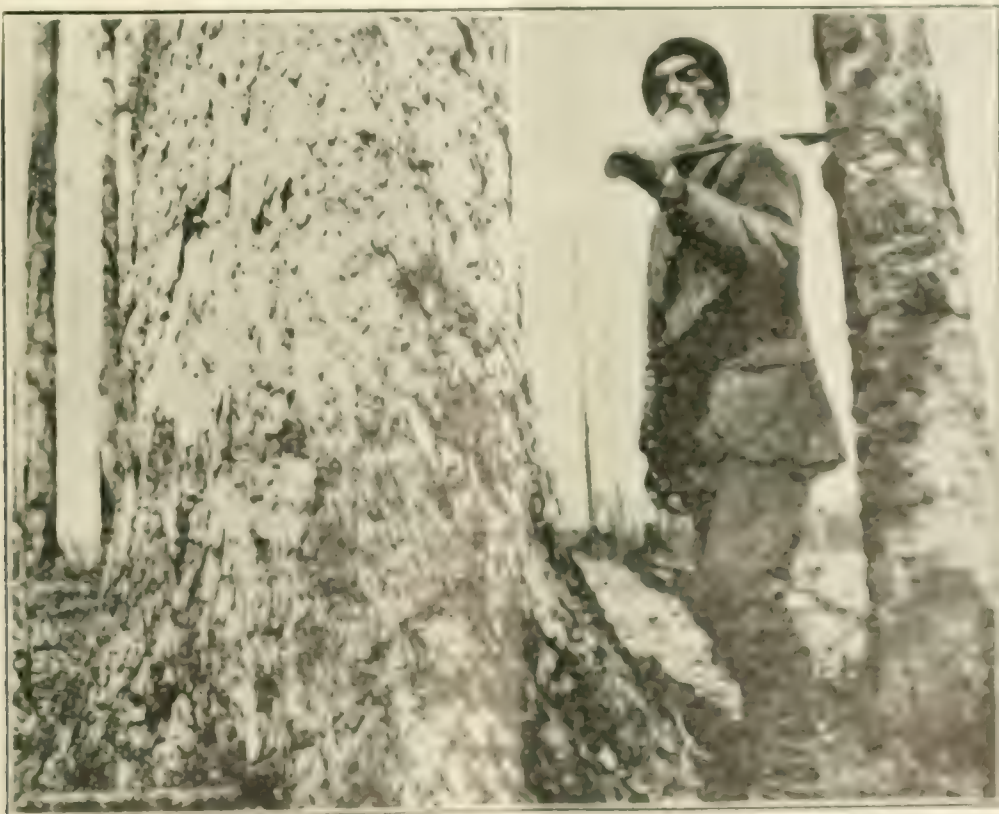
The value of any farm is greatly increased by having a woodlot large enough to furnish a permanent supply of fuel and timber for use on the farm. About 25 per cent of the farm in timber would furnish such a supply and when the timber is matured there would be quite a surplus to dispose of and contribute to the revenue of the farm. In the case of maple bush the sugar and syrup that may be manufactured from it adds still more to the revenue. On our own woodlot, which contains about 25 acres on a farm of about 95 acres, we have a constant supply of firewood and also plenty of timber for building purposes, and some to sell besides, each year; and by protecting the young growth and weeding out the crooked and leaning and mature and dead trees, the quality of the timber will gradually improve so long as one sells only what he doesn't need for his own use.

The varieties of trees represented naturally in my woodlot are: Cedar, hemlock, spruce, pine, basswood, soft maple, sugar in winter from blowing off the fall wheat maple, beech, ironwood, black birch, white

birch, black ash, white ash, basswood, hemlock, spruce, pine, soft maple, American elm.

The growth of timber annually is considerable, the farm has been the source of ready timber till it reaches maturity, as the wastefulness of allowing our own supplies to run among the largest trees more than it accounts for. Wood is so abundant, since a tree sometimes adds from two thirds of an inch to one inch to its diameter in one season.

Then the woodlot is a great asset in that it adds humidity to the air. It acts as a hot weather gives off a large amount of moisture through the leaves, and plant life in the fields and hence holds in a moist atmosphere. Where there is a shelter belt of timber it prevents the soil from drying out so rapidly in dry weather, as the greater the velocity of the wind in passing over a field the quicker it will dry out, and so hinder the growth of the crops. It also helps to prevent the frost and clover fields and so affords them better protection. In cold weather it prevents so great a loss of heat from the



In Mr. Payne's Woodlot.

buildings when they are protected by shelter belts of trees.

A woodlot also shelters and furnishes a nesting place for many birds that are so valuable in the fields and orchards. It also adds beauty to the landscape; and what is more refreshing and beautiful than the trees in leafy June or the varied colors of the trees in October?

On my own farm I have a hedge of evergreens on the west side of the orchard. Along the central lane through the farm the cedars are extending on each side from the woodlot on the west to the concession line on the east side of the farm. These in time will probably make a continuous avenue and windbreak. Besides there are many trees in the fences over the cleared part of the farm, affording shade to the stock in hot weather.

If one would have a permanent woodlot he must fence it and keep the stock out, as cattle eat the little seedlings of deciduous trees and injure the roots of the large trees by treading on them. Cattle and fire are two of the worst enemies of the woodlot. I would suggest as helps toward improvement in the woodlots on farms that the Report of the Department of Forestry for Ontario be distributed through the Farmers' Institutes, as in this way a greater interest in Farm Forestry and also in National Forestry would be created. Also that woodlots up to a certain percentage on each farm in well settled districts, under certain conditions, be exempt from taxation.

The large tree in the illustration is a tall, clean stick measuring four feet through at the base. This tree is a rent-paying sort, since it is a maple, and is tapped in two places each year. It is on Mr. Payne's farm.

The lodgepole pine of the west is used chiefly for mining timbers and props, and occurs, fire-killed, in vast areas on the mountain slopes of Alberta and British Columbia. It cannot be used for lumber, on account of checking, and, if untreated, it lasts only about fifteen years when used for railway ties. At present this wood stands dead and perfectly seasoned and would take chemical treatment readily, after which it would make lasting and economical ties. By the use of such inferior qualities of timber, railway companies would assist conservation and at the same time decrease the cost of railway maintenance.

The value of the cooperage industry in Canada in 1910 was \$1,740,709. Slack cooperage made up \$1,395,545 of this, or \$200,000 less than in 1909. Tight cooperage amounted to \$345,164, which is \$100,000 more than in 1909.

British Forestry Notes.

The Right Hon. Walter Runciman, M.P., President of the Board of Agriculture and Fisheries, has appointed a Committee to advise the Board on matters relating to the development of forestry. References will be made to the Committee from time to time as occasion arises. The Committee will be asked in the first instance: (1) to consider and advise upon proposals for a forestry survey; (2) to draw up plans for experiments in silviculture, and to report upon questions relating to the selection and laying out of forestal demonstration areas, and (3) to advise as to the provision required for the instruction of woodmen. The Committee is constituted as follows: Sir Stafford Howard, K.C.B. (Chairman); Mr. F. D. Williams-Drummond; Sir S. Eardley-Wilmot, K.C.I.E.; The Right Hon. R. C. Munro-Ferguson, M.P.; Lieut.-Col. D. Prain, C.M.G., C.I.E., F.R.S.; Mr. E. R. Pratt, President of the Royal English Arboricultural Society; Professor Sir W. Schlich, K.C.I.E., F.R.S.; Professor Wm. Somerville, D. Sc.; The Hon. Arthur L. Stanley. Mr. R. L. Robinson, of the Board of Agriculture and Fisheries, will act as Secretary.

Sir E. Stafford Howard has tendered his resignation of the office of one of the Commissioners of His Majesty's Woods and Forests. His resignation will take effect as from March 31st next. No new appointment of a Commissioner will be made to fill the office he vacates, and there will be a fresh allocation of the Commissioners' duties between the two remaining Commissioners, Mr. Runciman, the President of the Board of Agriculture and Fisheries, and Mr. G. G. Leveson-Gower. The supervision of the Crown Forests other than Windsor and of the more important Crown Woods will now be committed to Mr. Runciman, with the object of bringing their administration into closer co-operation than has hitherto been possible with the work of the Board in regard to the development of silviculture and forestry.

—Journal of the Board of Agriculture.

A new firm of forest engineers has recently opened offices in Philadelphia under the name of Clark, Lyford & Sterling. The members are Judson F. Clark, of Vancouver, B.C., C. A. Lyford, of Montreal, Que., and E. A. Sterling, of Philadelphia, Pa. Mr. Clark and Mr. Lyford are also identified with the well known firms of Clark & Lyford, Vancouver, B.C., and Lyford, Clark & Lyford, Montreal, Que. Mr. Sterling has resigned as Forester of the Pennsylvania Railroad, which he has held for the past five years. This organization is making a specialty of timber estimates and forest maps, and is prepared to examine and report on timber properties anywhere.

The members of the association have agreed to assess themselves one-fifth of a cent per acre for the coming year. The two protection. In response to a letter sent him by the association, exploring their subject and methods, Hon. James Albert Munroe of Lansing and Executive has promised that the provincial government will contribute about thousand dollars (\$4,000.00) to the association.

with no consideration of the possibility of creating the world's most polluted lands and in the U.S. and will also have a ripple in the rest of the world's nations and to please them.

N. B. SHADE TREE LAW.

The only legislation directly applying to shade or street trees in New Brunswick seems to be the 'Act respecting Local Improvement Associations', passed in 1903 (3 Ed. VII. c. 22.)

By this Act it is enacted that ten or more persons may be incorporated for the purpose of improving and ornamenting the streets and public squares of a city or town by planting and cultivating ornamental trees, under the provisions of the New Brunswick Joint Stock Companies Act.

Any city or town may hand over to such an association the care of the parks and the ornamentation of its streets and is empowered to make the association a grant for the purpose of assisting in its work. This grant may be levied and collected as part of the regular assessment.

A fine up to twenty dollars is provided for anyone injuring or interfering with the work of such an association by driving animals or vehicles across its property, playing ball thereon, etc., the fine to be payable to the association.

Fredericton, the capital city of the province, has an association formed under this act, which has done much in beautifying the city. Lt.-Col. Loggie, Deputy Surveyor-General of the province, is the president of this association.

The implement manufacturers of Manitoba paid in 1910 about \$67 per thousand feet for oak which they imported from the United States. White oak is native to Manitoba and reaches large sizes in the Turtle Mountain Forest Reserve. This reserve has been cut over and burned over, but it is now being put under scientific management. When properly stocked this reserve will produce 6,000,000 feet of white oak timber per year. The local production of this timber will be of great assistance to the industries of Manitoba. This is an instance of what can be done by the proper management of waste lands.

C.F.A. Treasurer's Report, 1911.

RECEIPTS.

Balance from 1910, \$1,033.67.
 Membership fees, \$2,002.22; copies of Canadian Forestry Journal, \$19.90; advertising in Canadian Forestry Journal, \$242.34; grant from Dominion government, 1910, \$2,000.00; grant from Dominion government, 1911, \$1,500.00; grant from N.B. government, \$100.00; grant from Quebec government, \$200.00; grant from Ontario government, \$300.00; grant from B. C. government, \$200.00; interest, \$35.50.
 Total, \$7,633.63.

EXPENDITURE.

Salaries, \$1,875.00; clerical work, \$130.08; annual report, \$200.75; expenses of secretary, \$200.00; printing and supplies, \$292.46; lantern and lectures, \$121.81; Quebec convention, \$2,095.00; Canadian Forestry Journal, \$1,019.51; commission on cheques, \$11.57; postage and telegrams, \$53.94; typewriter, \$120.00; refunds, \$9.00; wreath, \$10.00.

Total, \$6,139.12.

Balance on hand, \$1,494.51.

M. ROBINSON,
Treasurer.

Ottawa, Dec. 31, 1911.

Audited and found correct, Jan. 9, 1912.

FRANK HAWKINS,
 T. E. CLENDINNEN,
Auditors.

A Banker's Statement.

In Canada and the United States the use of fireproof building material and of cement and iron generally in place of wood is growing rapidly. Already it is suggested that the United States has passed the highest point of per capita consumption of lumber. As yet, however, we use only a fractional amount of fireproof material as compared with an old-world country such as Germany, so that an important readjustment of our lumber requirements relatively to other things will gradually come about. This will certainly not lessen the necessity for conservation, but it may cause the punishment for our wastefulness to fall a trifle less heavily than we deserve.

—*Report of the General Manager of the Canadian Bank of Commerce, 1911.*

The mines of Canada used, in 1910, 52,848,000 linear feet of round timber, which cost \$523,339. This is an average cost of \$9.90 per thousand. They reported the use of twelve species of wood in their mining operations.

Oak, together with yellow pine, made up nearly one-third of all the wood used in the furniture and car industry of Canada in 1910. Practically all is imported.

With the Forest Engineers.

NOTES FROM THE SCHOOLS.

The Faculty of Forestry of the University of Toronto has this year forty five students in attendance, the same number as last year. Of these, six men are taking the combined Arts and Forestry course. Besides these and the regular four-year course men, there are also a number of non-matriculated students, taking special courses. Thirty three of the students are Ontario men, while three come from the United States and one from England. The standard for entrance to the faculty is again being raised for the session of 1912-3, and will correspond nearly to senior matriculation. The standard demanded on examinations will be forty per cent. on each paper and sixty per cent. on the aggregate, except in English, for which the minimum is sixty six per cent. A course of lectures by Dr. von Schrenk on Diseases of Trees and a course of lectures in First Aid to the Injured are new features of the curriculum. The Forestry Club is found to be a very useful and interesting adjunct to the regular class work.

The Forest School of Laval University has an attendance of forty students; of these seven are in their final year and will graduate this spring. The second year class (that of 1913) has twelve students, and the first-year class twenty one men in attendance. Of the total of forty men, twenty seven have scholarships and work in the provincial Forest Service. The courses comprise elementary and higher mathematics up to, and including, calculus, applied mathematics (surveying, mechanical construction of mills, road and trail building, drawing and mapping), forest science (forest botany, dendro-

logy, soils, forest zoology, silviculture, reforestation, management, lumbering, wood industries, technology, forest geography, lumber markets, statistics and law) and the elements of medicine and surgery.

The forestry department of the University of New Brunswick also reports a successful year. One of the latest additions to its equipment is a special forestry and engineering permanent camp. This comprises a substantial log building the construction of which was done by the students themselves on the tract of forest land owned by the university and situated only about three miles from the university itself. A description of the building and of its construction, from the pen of Professor Miller, will appear in next issue of the *Journal*.

Mr. W. N. Millar, M.E., has been appointed District Inspector with headquarters at Calgary. He will have entire direction of all the Alberta reserves. Mr. Millar has been for a number of years in charge of the Kootenai National Forest in Montana, which is some three million acres in extent, with complete control of its administration, including the organization of a fire ranging force, the sale of timber, and the disposal of claims of various kinds to lands within the reserve. During the summer of 1910, when as great a loss of life and property occurred in Idaho and Washington from forest fires, the forest under his charge protected almost unscathed, owing entirely to the efficient fire protection organization he had built up. This organization includes patrol a system of trails and inspection lines with other effective features. Mr. Millar assumed his new duties in March.

Mr. H. R. MacMillan is now in the West and will visit various offices of the Branch with a view to improving organization and methods of work.

Mr. D. Roy Cameron has been appointed to take general supervision of fire protection and other work in the Dominion forest reserves in British Columbia.

Appropriations for forestry work under the Department of the Interior amount for the ensuing fiscal year to \$355,000, an increase of \$100,000 over last year.

Dr. J. F. Clark, of Vancouver, reached home about the middle of March after an extended trip east.

Prof. Filibert Roth, who is at present the only honorary member of the Canadian Society of Forest Engineers, has been appointed head of the recently revived department of forestry at Cornell University.

The purchase of the Nipissing Central railway, an electric road running from Cobalt to Haileybury, by the Timiskaming and Northern Ontario railway, is thought to foreshadow the electrification of the latter road. This step would be a measure of tremendous importance for the protection of Northern Ontario forests, and is a consummation devoutly to be wished.

In the French forest of Chantilly rabbits have become so numerous as to threaten the destruction of the entire forest.

Cedar is the wood most frequently used for poles in Canada, as it is practically the only Canadian wood growing to a convenient pole size which is cheap, easily handled and durable. There were 758,209 cedar poles purchased in Canada in 1910, or 99.2 per cent. of the total number purchased.

The state of Maine will again this year receive from the U. S. federal government a grant of \$10,000 to assist it in protecting its forests from fire, according to the provision of the Weeks bill providing for co-operation between the federal and state governments for this object.

The furniture and car manufacturers of Canada used, in 1910, 177,893,000 board feet of timber, costing \$2,987,210. That the timber used in these industries is of a much higher average quality than the mill run of Canada's saw mills is shown by the fact that it cost \$25.35 per thousand, whereas the average selling price of the lumber produced in Canada in 1910 was only \$15.81.

Much of the timber used in Canada for the manufacture of furniture and cars is imported. In 1910 one-third of the total used was imported, chiefly from the United States, at an average cost of \$33.86 per thousand board feet; two thirds were native-grown timber and cost only \$20.82 per thousand board feet. Nothing could more clearly show the general inferiority of the common Canadian timber for use in manufactures than the fact that Canadian manufacturers are forced to buy fully one third of their supply from a foreign country at a price exceeding, by over sixty per cent., that paid in the home market. It is impossible to secure in Canada, in sufficient quantities, woods which combine beauty with strength so as to be suitable for furnishing high-grade furniture and passenger cars, or which are strong enough for car frames or sidings.

Including round and sawn timber, timber to the value of \$827,337 was used in Canada during 1910 for mining purposes. This total is made up of 52,848,000 linear feet of round timber, worth \$523,339, and 22,305,000 board feet of sawn timber which cost \$303,998.

CHANGES OF ADDRESS.

The secretary would be grateful if members of the Association would promptly notify him of any change in their addresses, so that the addresses on the mailing list of the Journal can be kept correct. Persons removing from one place to another should give both the old address and the new; this will greatly assist in the corrections.

R. O. SWEZEY,

CIVIL & FORESTRY ENGINEER

Timber Surveys, Lumbering
and Water Powers.

Metropolitan Bldg.

QUEBEC, Canada.

Canadian Forestry Journal

VOL. VIII.

MAY-JUNE, 1912

No. 3



Single White Pine on Lachute (P.Q.) Sand Hill.

Height, 84 ft., diameter at breast height, 74 in., 1880, 1900, 1910.

Forest Engineers Wanted.

Opportunity is offered in the recently organised Forest Branch of British Columbia for the immediate employment of several Canadian Foresters. Only graduates of Professional Forest Schools need apply. Address, enclosing full statement and photograph,

FOREST BRANCH LANDS DEPARTMENT, VICTORIA, B.C.

THE CANADIAN FORESTRY ASSOCIATION.

is the national organization for the informing of public opinion in the effort to secure a rational development of the Canadian Forests through the co-operation of national, provincial and municipal organizations and private enterprises. The objects of the Association are:

- (1) The exploration of the public domain, so that lands unsuitable for agriculture may be reserved for timber production.
- (2) The preservation of the forests for their influence on climate, soil and water supply.
- (3) The promotion of judicious methods in dealing with forests and woodlands.
- (4) Tree planting on the plains, and on streets and highways.
- (5) Reforestation where advisable.
- (6) The collection and dissemination of information bearing on the forestry problem in general.

To promote these ends the Association publishes the *Canadian Forestry Journal*, issues bulletins, arranges for the delivery of free illustrated public lectures, and holds conventions in different parts of Canada.

The Association desires as members all (both men and women) who are in sympathy with this work. The membership fee, which entitles the member to the *Journal*, the annual report and other literature issued, is one dollar per year, (life membership \$10). Applications for membership or requests for information may be addressed to the Secretary, Canadian Forestry Association, Canadian Building, Ottawa, Canada.

CANADIAN FORESTRY ASSOCIATION.

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Canadian Forestry Journal

VOL. VIII.

OTTAWA, MAY-JUNE 1912.

No. 2

THE official organ of the Canadian Forestry Association. A magazine devoted to the interests of forestry and in general to the utilization of the wise and conservative use of the natural resources of Canada.

Annual Subscription. - \$1.00
Single Copy. - - - 25c

Literary Contributions and communications regarding editorial matters together with communications regarding subscriptions, changes of

address and advertisements should be sent to the Secretary, Canadian Forestry Association, Canadian Building, Ottawa, Ontario.

The Canadian Forestry Journal is a good advertising medium.

Advertising rates on application.

Executive Committee: J. D. Hunter, Editor; G. C. Davis, Associate Editor; Frank Macmillan, R. H. Campbell, J. M. Macmillan, A. B. Dickson, F. W. H. Langille.

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Our Next Forestry Convention.

Victoria B.C., Sept. 4-6, 1912.

At a meeting of the Directors held on May 9 in the office of the Director of Forestry, Ottawa, a large amount of correspondence was considered in regard to the time and place of holding the next Annual Convention. Invitations were in hand from Winnipeg and Victoria, B.C., the latter an

official invitation from the Government of that province. After full discussion, in which all the various aspects were considered, it was decided to hold the Convention in the City of Victoria, B.C., during the coming autumn. Owing to many reasons, which need not here be gone into, the

question of the date was even more difficult to decide. It was finally resolved to leave the selection of the date to the President, Mr. John Hendry, and the Premier of British Columbia, Hon. Richard McBride. These gentlemen at the time of the meeting were in London, England, and they cabled the Directors strongly urging that this year the Convention be held in British Columbia. It was suggested by the Directors, however, that Sept. 4 and 5, other things being equal, would be a suitable date. The results of this meeting were cabled to London, and the dates were accepted by the gentleman above named. On Mr. Hendry's return from England he met a number of the Directors of the Forestry Association at an informal meeting called when he was passing through Ottawa on May 27. At this meeting the subject of the date was again gone into and the suggested date was confirmed with a rider that Sept. 6 be added if found necessary to accommodate all the features on the program. It was also decided at this latter meeting to direct the Secretary to proceed as soon as possible to British Columbia to consult, in company with the President, with the Hon. Richard McBride and the Hon. W. R. Ross, Minister of Lands, in regard to the program and its different features. Both the Premier and Mr. Ross are taking a very enthusiastic interest in the subject.

British Columbia has just enacted a new timber and forestry law and is adopting a very progressive attitude in regard to the conservation and proper disposal of its immense forest wealth. Great interest prevails on the Pacific coast in regard to the new law, and to modern methods of lumbering, but the interest of the Convention will not be confined to these but will embrace projects and topics relating to all the provinces and to the work of the Dominion Government. At the season of the year when the Convention will be held here there are in force special

rates from eastern points on the different railways, and it is hoped to announce in the next issue what the best rates available from Montreal, Ottawa, Toronto, Winnipeg, Regina, and other points will be. This will be the first Convention held on the Pacific coast since 1906, and in addition to the enthusiastic attitude of the government as above noted, Mr. Hendry and the leading members of the Forestry Association on the Pacific coast are determined to make the Convention worthy of the great timber resources of that province. Our members are urged to make a note of these dates and to hold them open so that if possible they may be able to attend and take part. It is hoped that by the next issue of the *Journal* to have a full statement of the program and other details for the members. Those who expect to be present will greatly facilitate the work of preparing for the Convention if they will notify the Secretary, Canadian Building, Ottawa, of their intention.

OIL-BURNING LOCOMOTIVES.

At the meeting of the Directors of the Canadian Forestry Association on May 9 the following resolution was adopted:—

That the Board of Directors of the Canadian Forestry Association place on record their hearty approval of the proposal that at the earliest practicable date a regulation be brought into force compelling the use by railways of oil-burning locomotives in dangerous districts and during dangerous seasons, and that a copy of this resolution be sent to the Board of Railway Commissioners for Canada.

A conference on farm forestry will be a feature of the Seventh International Dry Farming Congress, which is to be held at Lethbridge, Alta., Oct. 21 to 26, 1912.

The plantation of 40,000 white pine, set out last spring by Dr. A. R. Myers, of Moncton, N. B., is thriving. The owner is planting 50,000 trees this spring and expects to put out 100,000 more next spring.



[Photo A. Blacketer, 1917]

University of New Brunswick Foresters' Log Camp

A Forestry Students' Camp.

By R. B. Miller, M.F., Professor of Forestry, University of New Brunswick

There has been a growing feeling on the part of the Forestry Department of the University of New Brunswick that they should have a permanent building on their own lands within walking distance of the college, so that students might have, from the first, the right setting for their profession.

The Engineering Department last fall decided that instead of paying someone along the Keswick for the privileges of a camp site and for clearing out lines for imaginary railroads that the camp might be very profitably transferred to the college lands. Such cleared lines could then serve admirably, at little extra expense, for roads, trails, and fire lines, while the whole tract could offer almost inexhaustible opportunities for carrying on all lines of surveying. And in the picture of this chosen ex-

position between the foresters and engineers loomed large a cosy log camp with great open fireplaces, instead of musty, smelly beds, with no chance for office work to hinder the dull monotony of the inevitable rainy days—often a total loss to the student and a sore trial to the instructor.

The result of a combination of these two desires has now embodied itself in a log camp, on a good tract containing the Corbett's Brook, less than three miles in a direct line from the college buildings. Being situated between two brooklets, abundant supply of good water is assured.

A party of fifteen men, about the middle of October, then and there, to clear off a place for the camp on a slight ridge well up from the brook. On this first day a few began felling trees on the flat across the brook and

around the camp. As it was desired to have the inside dimensions sixteen by twenty feet this meant that the logs must be nineteen and twenty three feet in length, allowing a foot and a half projection at the corners. Straight, sound fir logs were for the most part chosen, varying in size from ten to fourteen inches in diameter at breast-height. A few straight and over-mature popple were cut and all trees were marked before cutting so that too heavy a thinning might not be made in any one place. About fifty trees were required in all, and every man was found eager to fell trees but not so eager to clean up the tops and pile brush afterwards. In pursuance with good forestry regulations it was insisted upon that the crews cut off and pile all branches before taking another tree—a decided innovation to those used to the ordinary lumbering methods in New Brunswick. This lesson will no doubt be a valuable one for all classes of students and will give them an idea of how the woods should look after lumbering in a conservative manner, with proper slash disposal.

Most of the New Brunswick boys, engineers as well as foresters, have been raised near the woods and are excellent axemen, felling their trees to a nicety and 'sampsoning' them over with a short pole to the desired spot, when necessary, with the skill of veterans. Many haggled stumps betokened the work of the inexperienced but these men hung to the task, despite blistered hands, until their trees were either down or comfortably supported by four or five others.

After felling came the sawing up into proper lengths, and several were initiated into the mystery of cross-cutting with the saw without causing the other man excruciating agony. Crews were then put to peeling the logs which, in knotty timber, is no easy task until the proper kink is learned.

The work of felling and peeling proceeded for a few Saturdays with

a crew of men varying in number from fifteen to thirty, from all departments. Some logs were then carried on the shoulders of the men across the brook and up the slope — no easy task with green, balsam-covered logs. Three of the men, who had seen lumber camps erected, began notching the corners and putting the first logs in place. As the logs were quite large and had considerable taper, in order to keep the walls level, some had to be notched very deeply, and in many cases small drop logs had to be let in between. The work was carried on at intervals until, at Thanksgiving, the camp was three or four logs high.

During this short vacation it was decided to push the work more rapidly and three men went out and made a temporary camp across the brook, putting up the usual 'lean-to' tent used by the guides and lumbermen.

The camp outfit was taken out by pack-horse in true western fashion, with the famous 'diamond hitch' (learned from a New Brunswick guide) over all to advertise the fact that we were not 'tenderfeet,' even if we had never been west of the 100th meridian. The pack-saddle, by economizing with canvas girths and using straps of moose-hide, was constructed for us by the same guide at a cost of less than \$10.00 and serves every purpose of the higher priced article for short trips. There are two ropes which accompany it, one about one-quarter of an inch in diameter and thirty feet long, and the other, used for the final hitch, a half-inch rope about 36 feet long (which seems of ample length the first time you use it).

With only three or four men working on the camp during this short vacation it was found impossible to carry big logs over the brook, although we found they grew perceptibly lighter after being peeled for a week or more. The ingenuity of the boys overcame this difficulty in short order. The broad girth of the pack-

saddle outfit was passed around the breast of the horse—who knew more about the woods than we did, it proved fastened in place by the smaller rope, and the long rope used as traces, being finally attached to a short spruce single tree, with a long enough end left for a noose to take the place of logging tongs. By snubbing the ends of the logs and swamping out paths, enough logs were soon yarded for the rest of the construction work, and the walls soon brought up to a height of seven feet, which was considered ample. Rafters of round, peeled, spruce poles were then put up, about two and a half feet apart, and spiked to the side logs. The ones at each end of the building were made double, that is about six inches apart, so that the short logs forming the gable could be dropped down in between.

A tight sheathing of second-grade hemlock boards was then nailed on over the rafters and a layer of triple felt put on lengthwise, and the edges tarred, a roof warranted to last ten years or longer.

After levelling off the ground inside, sills of peeled logs were sunk about two feet apart and two layers of hemlock boards put down as a floor, the first layer of cheap material, the last surfaced on one side.

The chinking, or 'stogging' of such a camp is more of a task than appears at first thought. Moss was gathered from the high ground in the woods and carried in sacks to a place alongside the building, an immense quantity being required. This was pounded in with a tamp from the outside at first, but cold weather setting in, the rest of the camp was chinked from the inside.

The camp will become, in time, the center of a large field of future operations—the construction of roads, trails, and fire lines, telephone lines, of brush-burning, of thinnings and cleanings, of cutting of logs and cordwood, of surveying, mapping and estimating, and perhaps later of some

experimental work in silviculture whose results may become an object lesson to owners of timber. The entire camp has cost not over \$25.00 all told, and if Yale and the other graduate schools are hungering after demonstration forests of their own, which they can handle to get results and give their men training, we think we are fortunate and the University of New Brunswick is fortunate, in finding such a tract lying at its back-door and knowing that this camp is going to mean getting right down to the humus from this time on.

Such is, in brief, the history of the building of this camp which means to the foresters of the University a comfortable retreat for work and recreation. Not only has it given them some valuable construction experience not down on the regular schedule, and hence more valuable, but has, as its walls rose, log upon log, from the brown earth, built up that spirit of brotherhood and loyalty to class and school which we believe to be one of the strongest assets in the future. More than that, it has brought a little nearer to all that invisible spirit of the woods which the forester feels but cannot explain to others, that spirit which makes him a fighter and transcends salary or worldly honor and leads its recipient to struggle through muskies and over mountains, along the unblazed trail—"a pioneer in a new profession."

The total value, at the point of production, of the annual forest products of Canada is at least \$100,000,000. This is \$33.44 for every person in Canada, March 31, 1909. In 1909, there were in that Dominion about 400,000,000 bushels of timber for every inhabitant of the country. This is a very large timber supply compared to that of any of the other countries mentioned in this month.

The Atlas of the Dominion of Canada, published in Ottawa, and EFA in British Columbia and the EFA in Quebec have been sold and these books together make up the greater part of the remaining 100,000,000 bushels of timber for every inhabitant of the Dominion. This is a very large timber supply compared to that of any of the other countries mentioned in this month.

Les usages du Bouleau à Papier.

(Extrait du rapport annuel du Ministre des Terres et Forêts de la Province de Québec pour 1910-11.)

Il serait intéressant de détailler les divers usages auxquels le bouleau à papier convient et de montrer les ressources que l'on en pourrait retirer. Tout d'abord on en fait des bobines pour filatures, aussi des sabots (industrie inconnue ici), des chevilles et des enforts pour chaussures, des cure-dents, des épingles à linge, des jouets d'enfant (cette industrie est très florissante dans le Maine), des barreaux de chaises, des goujons, des navettes, et autres bois tournés. On ne fait encore des règles et des équerres. Les jeunes tiges servent à faire des cercles et aussi à la confection de balais.

L'écorce servait à nos indiens pour la construction d'excellents canots.

Nous ne pouvons résister à la tentation de reproduire ici une page de M. Mathieu, dans sa Flore forestière, au sujet des emplois accessoires du bouleau verruqueux, qui a beaucoup d'analogie avec notre bouleau à papier :—

'L'écorce de bouleau, particulièrement le liber qui en est la partie la plus active, contient du tanin, 1.6 p.c. d'après Davy; elle est très recherchée par les habitants du Nord de l'Europe, pour la préparation du cuir, auquel elle communique une couleur particulière et une odeur caractéristique. On en extrait par voie de distillation sèche, une huile essentielle avec laquelle on enduit les cuirs de Russie. Elle s'enflamme facilement et fournit un bon combustible.

'L'écorce blanche renferme, presque en moitié de son poids, une résine particulière, la bétuline, que l'on peut extraire par l'alcool, puis faire cristalliser. C'est sans doute l'abondance de cette substance qui assure à son écorce une inaltérabilité et une

imperméabilité si remarquables... La première de ces qualités est telle, que dans des tourbes et des lignites, on trouve des portions d'écorce de bouleau parfaitement intactes, tandis que le bois est totalement détruit. On le met à profit dans les régions du Nord en revêtant d'écorce les portions des pieux qu'on enfonce en terre. On sait que l'imperméabilité de cette écorce la fait rechercher pour en fabriquer des tabatières; on peut aussi en faire des semelles aussi bonnes que celles de liège, pour garantir contre l'humidité; enfin, en la distillant dans des fours, elle produit un goudron. Ce goudron est fort recherché, il égale 86 p.c. du poids de l'écorce; en redistillant ce produit on obtient un huile dite huile du goudron de bouleau, qui sert à donner l'odeur du cuir de Russie aux imitations.

'L'utilité de l'écorce est telle, qu'en Russie elle est soumise à une exploitation périodique, tout comme le liège en France (et en Espagne). En ayant soin de ne pas entamer le liber (partie verte de l'écorce) la partie subéreuse et lamelleuse se régénère facilement, sans que l'arbre ait aucunement à en souffrir.

'Les verrues et les bourgeons contiennent aussi de la résine, mais celle-ci ne cristallise pas comme la précédente.

'On retire de la feuille une matière colorante employée en peinture sous le nom de styl de grain.

'La sève du bouleau renferme une notable quantité de sucre, 8.7 par 1,000 K. Concentrée, puis soumise à la fermentation avec addition de sucre et de différents aromates, on en fabrique une boisson spiritueuse très appréciée dans ces contrées.. (F. Forestière pp. 414-415).'

Nous ajouterons que l'écorce du bouleau à papier peut servir à des fins architecturales dans la décoration des villes. On en fait des paniers pour mettre les plantes. L'écorce de bouleau à papier est beaucoup employée pour postales.

Les déchets, comme les écorces, peuvent être utilisés pour la fabrication de l'alcool de bois et de l'acide acétique.

A St-Ignace du Nominigüe, M. Lacaille, un industriel ingénieux, que manufacture des bois de placage (veneer), emploi le bois de cœur, pour faire des poteaux de clôture (en les créosotant, on prolonge leur durée). Il s'est servi de ces bois de cœur, au préalable débités en deux parties, de forme identique et de même volume, côté plat et face rebondie, pour décorer la résidence d'été qu'il s'est construite sur les bords du lac Nominigüe.

Comme on voit, il y a un immense

parti à tirer du bouleau à papier, tant de son bois, que de son écorce, et même de ses feuilles (qui, d'après Girard, peuvent servir comme fourrage).

Il serait à souhaiter que nos industriels cherchent à utiliser ces propriétés. Nos fermiers surtout devraient, durant les longs mois d'inaction, à l'instar de leurs confrères d'Europe, rechercher à profiter des qualités qui rendent le bouleau propre à une foule d'usages et très variés, développer la petite industrie du bois, qui donne des revenus si considérables aux pauvres paysans des Flandres, du Jura, des Vosges. Le Service Forestier, lorsqu'il sera mieux organisé, s'efforcera de répandre ces idées dans la population en exhibant, lors des expositions régionales, quelques uns de ces produits, en donnant des conférences, en divulguant par la presse, des bulletins, etc., ces connaissances.

Quebec Province Starts Forest Planting.

The planting up of the waste sand lands at Lachute, P.Q., has been actively taken up this year by the provincial government, and during the first two weeks of May the students of the graduating class of the forestry school of Laval University were engaged in the work of planting a portion of the area known as the Argenteuil Sand Hill. The work was done under the direction of Mr. G. C. Piché, M.F., director of the forestry school and chief forestry engineer of the Department of Lands and Forests of the province.

On May 14 a representative of the *Forestry Journal* visited the scene of the planting, and was courteously shown around by the student planters.

Lachute is a town of some 2,000 inhabitants, situated on the north shore of the Ottawa, and on the North Shore line of the C.P.R. from Ottawa

to Montreal. It is distant some 44 miles from Montreal and 76 from Ottawa. In the neighborhood of the town are three areas where drifting sand has covered the better soil and threatens, by its further drifting, to become a menace to agriculture in its vicinity.

The largest of these, on which the planting is being done, covers an area of some one thousand acres. It is about four miles in length, and varies in width. The particular site on which planting is being done is about four miles east of the town. Much, if not all, of the area covered by it was once cultivated. An old resident of the locality explained to the writer that about a generation ago the district was visited for several years in succession, by a plague of grasshoppers which ate practically all the green vegetation, and it was soon after this that the

sand, by that time deprived of all the grass roots which had formerly held it in place, began to drift. Little was thought of it at the time, but the drifting became worse and worse until it got beyond the power of the people to stop it, and for many years the area has lain uncultivated. Looking over an expanse of a couple of hundred acres, which included the land just planted, the narrator continued, 'I have ploughed every field you see here.'

While the soil is pure sand, and becomes very dry on the surface, yet

owners of the farms, evidence of which is to be seen along the way out to the planting area. As far back as 1898 the Central Experimental Farm assisted by sending out planting material to farmers in the vicinity. The chief trees sent out by them have been white pine, white spruce, Norway spruce, balsam fir and tamarack.

On this hill the provincial government has purchased some 375 arpents (about 320 acres) of land, with the intention of eventually planting it up to species of valuable trees. The original owners of the land are



[Photo F. W. H. J., May, 1912.]

Fields Covered by Drift Sand Near Lachute, P.Q.

(Note Buried Fence).

even in the driest times abundance of moisture is found four or five inches below the surface. Some trees of good size are found growing on it, among the species found being white pine, tamarack, balsam fir, white spruce, white cedar, balsam poplar, aspen poplar and white birch. Willows planted there have been very successful.

A certain amount of planting has been done in former years by the

to be allowed to buy back the forested land, after a term of years, if they so desire, at a price that will recoup the government for its outlay. This spring a beginning of the work is being made on a small area of about thirty arpents purchased from Mr. Paul Nicholl. The area is triangular in shape, and is well suited for the purpose, being well protected by trees on two sides, especially to the north and west. When the planting



[Photo F. W. H. J., May 1912.]

Part of 1912 Plantation at Lachute, P.Q.

is completed, a wire fence will be erected around it, so as to keep out all stock.

Some thirty thousand trees will be required, which are supplied from the provincial forest nursery at Berthierville. The trees are three-year-old stock, divided almost equally between white pine and white spruce. A small number of ash and elm are used on the most favorable sites. The pine and spruce are planted in alternate rows, five feet apart each way, that is to say, the rows of trees are five feet apart, and the trees are placed five feet apart in the row.

The land on which the planting is being done has the North river to the north and the Canadian Northern Quebec railway to the south, though neither the river nor the railway touches the area.

The road out from the village leads through a prosperous farming country, but only a short distance out from the village indications of drifting sand are to be seen and all along the road are frequent instances of planting, chiefly of conifers (spruce, pine, etc.) and of willows.

The planting will be continued next year on an area immediately to

the east of the area planted this year, and this fall a strip will be sown with beach grass so as to furnish protection for next year's planting.

The students who are planting the area are Messrs. F. Laliberté, C. J. D. Marquis, B. Gauthier, J. R. Gauthier, E. Michard, G. Houvert and H. Roy.



A Good Average Specimen of the Spruce Seedlings Planted

This young white-barked spruce seedling was planted May 11, 1912.

Our Forest Reserve Problem

(Paper read at Annual Convention of Manitoba Horticultural and Forestry Association, Winnipeg, February, 1912.)

By J. R. Dickson, M.S.F.

This subject, namely 'Our Forest Reserve Problem,' is a very large and broad subject, with many and diverse ramifications and interrelations.

Let us see if we can outline some of the more important factors in what I have termed our Forest Reserve Problem. In the first place it is a complex problem. The great ultimate object which the Forestry Branch has in view in every piece of work undertaken on the forest reserves is a 'Normal Forest.' And when one says 'Normal Forest' every simon-pure forester has at once a picture before his mind, a forest where every acre is fully stocked with tall, clean, straight, thrifty trees, of the most valuable species which that climate and soil will grow. A 'normal forest' is a piece of land producing the largesse quantity of the most valuable timber possible, in the shortest possible time.

But that ideal must remain forever unsatisfied. No forester has ever yet been, or ever will be, able to say: 'There, that is the most which that acre can produce.' Even in that famous forest of the City of Zurich — the Sihlwald — which has been producing its crops for a thousand years, the quantity and quality is still improving. Its revenue return last year was some twelve dollars per acre.

A normal forest, then, on each reserve is what we are after, and to secure it we have only to surmount the twin difficulties of protection and reproduction, for that other terrible bogie of the private timber owner—the taxation question—does not concern us as yet on the forest reserves, and perhaps never will.

Forest Protection.

When I say 'Protection,' you think instinctively of fire and the fire-hazard; and rightly so, for the damage done each year in our forests by insects, fungi and wind is usually insignificant when compared with the fire loss. To secure real protection which protects is the very first essential and basis upon which all further forestry work must rest. For whether we consider mature timber, or reforestation work, it is very clear that to start forest management would be a mere absurdity so long as the investment were even liable to be burned up.

At every forestry convention in Canada up to the present this vexed initial problem of fire protection has received almost sole attention and discussion. No doubt much good resulted from these conventions, but the evil still flourishes and the great careless public looks on in good-natured tolerance.

Outside of more or less indirect assistance from legislation and education there are in America to-day two general direct schemes for combating the fire danger; these are the warden system and the patrol system. The former, in use by many of the United States up till recently, was found too inelastic to answer the purpose, and is now rapidly being discarded or modified.

Fire Prevention.

The principal of prevention and its elastic adaptability are the two things which make the patrol system so efficient, for in fire-fighting the proverbial ounce of prevention is worth a ton of cure. I take issue

with all pessimists who say, 'Oh, you can never reduce the fire danger sufficiently to make forestry worth while.' It is true that the dry interior climate here and high winds make the danger rather greater for us than it is in Europe; but not seriously so, and over there, except in Russia, the annual fire loss is now an entirely negligible quantity.

The Forestry Branch is this very winter adopting active measures to install, extend and buttress the patrol system on all the reserves, with special attention to the Riding Mountains. Some fifteen good lookout hills were located around that reserve, and as fast as possible towers will be erected on these and men installed in the danger season, with telephone connection to the Chief Ranger. Trail extension and improvement is being pushed. The 262 miles of boundary line round this reserve has practically all been cut out eight to sixteen feet wide and will be turned into a road or bridle-path, as the local topography will best permit. This boundary trail will also have some value as a fire line.

To safeguard this reserve still further against insweeping settler and prairie fires, a plowed guard is now being made along the south and west, twelve to sixteen feet wide. As a start 35 miles was done last summer, with two team of oxen on a breaking plow. If the public will but grant its sympathetic co-operation and a decent amount of money, the Forestry Branch will undertake to adequately protect the reserves.

Renewing the Forest.

Mr. Warren, a forester from the United States, who visited over 150 German coniferous forests in 1911 reports that on only three of them was natural reproduction being depended upon; that is to say, on ninety-eight per cent. of German forests natural regeneration has been discarded as being too uncertain.

Planting gives them straight, uniform trees which have a market value right from the first thinning to the final cut.

In our case, however, the fact that we have on these western reserves such large areas to re-clothe, as compared with Germany, coupled with the further fact that labor here costs three to five times as much as there, makes it obligatory for us in Canada to continue diligent experiments, looking first toward developing, if possible, satisfactory methods of natural reproduction of existing timber as it is cut away, or failing that, the successful sowing of seed on a large scale. It looks at present as though the planting out of nursery-grown trees might be too costly an operation for general adoption on our reserves.

And yet, would it be? Every year, you, the owners of these reserves, are losing thousands and thousands of dollars on account of the vast areas of land now lying idle as the result of original denudation by fire or lumberman and repeated fires since.

I think we should all be appalled if we could ever get a clear appreciation of the tremendous loss involved in the continual holding of all this land as unproductive capital. True, one might say in crossing the Riding Mountain reserve, that there was not much of the land but had trees of some sort on it. But Mother Nature knows naught of business or commerce—in fact she decidedly favors the comparatively useless aspen or balsam fir instead of the really valuable spruce. Poplar is normally so defective from disease, frostcrack, windshake, etc., as to be hardly worth lumbering, and still you are permitting it to occupy land that will grow the finest of spruce—or, for all that is known to the contrary, even red or white pine.

One hundred years ago the public forests of Denmark were an almost pure stand of relatively valueless

hardwoods; to-day, as a result of patient labour and co-operation over sixty per cent. of the land is growing the highly profitable and rapid-growing Norway spruce. What is to hinder Canadians achieving a like success on their reserves if they just go after it in earnest and leave politics out?

The chaotic conditions found on Canada's reserves to-day are quite similar in general to those of Europe one hundred years ago. Like us, they were then spending about one cent per acre for protection and maintenance and getting in return an infinitesimal revenue. But year after year the Germans, for instance, have been spending more money and getting larger and larger net returns. In 1909 the average expenditure per acre over the entire government-managed forests of Germany was some three dollars and twenty five cents, while the financial net revenue per acre was two dollars and twenty five cents—a net money return of two dollars and twenty five cents per acre, quite outside of all those enormous auxiliary forest benefits which nourish the very life of the nation, quite outside, too, of the living made by the many thousands of workers which is represented in the expenditure of that other three dollars and twenty five cents. Do not forget, however, the long initial period of expenditure, of sacrifice and of patient experiments, of which this grand result is the fruits.

What Will It Pay?

Let us see now about what the Riding Mountain reserve could do as a wealth producer and consumer of labor were it covered, say, even with white spruce—a native species that flourishes there—and we had reached that stage of forestry where the annual cut can be based on the annual growth. The public forestland of France—much of it being thin Alpine soils and in no way comparable to our rich, though stony, Riding

Mountain soils — is producing an average of 240 board feet per acre per year; the Austrian forests, 300; the German forests, 380. Accurate measurements taken on the Pacific Coast show that the climate and soil there will grow six to eight hundred board feet per acre per year. Surely then, the Riding Mountain would grow two hundred. The total for the reserve would thus reach, in round numbers, 200,000,000 board feet a year. That quantity would tax the combined sawing capacity of the great mills of Ottawa and Hull. It would annually supply to each one of fifty saw-mills as much timber as is now being cut each year for all purposes over the whole reserve. The net annual return derived, if we figure stumpage at only five dollars per thousand feet, board measure, would be, on the German 1909 ratio, at least 400,000 dollars. On the basis of the forest labor employed in Saxony, the production and crude manufacture of the above-mentioned crop would support a population of ten thousand workers.

The timbered area of Nova Scotia is only two and a half times the size of this reserve—yet no fewer than 240 saw-mills are now supported by its annual cut, and this cut promises to be maintained and increased by the progressive forest policy being adopted in that province. Again, in Great Britain public opinion is beginning to clamor for an active national forest policy. Take, for instance, the following statement issued in February, 1911, by the General Federation of Trade Unions in the United Kingdom:

‘To absorb surplus labor an urgent appeal is made for afforestation. The employment furnished by the present uses—mostly grazing—to which our wild land is devoted, may be taken to average one man per 1,000 acres. This does not represent one tenth of the permanent employment afforded by the maintenance of a similar area under forest. The labor

connected with imported timber and timber products is performed abroad; the labor incidental to home-grown timber would be performed in our own country and would afford maintenance to many thousands of families."

Or take the following from a report issued only last fall by a cautious British Royal Commission on Forestry:

"The final and conclusive test of the value of afforestation must be its ability to improve the existing condition of a given district as to population, employment and economic returns. If, by means of afforestation on a financially sound basis, land which is too poor to cultivate can be made to give more employment and support a larger population than it is capable of doing under pastoral conditions, then the future of afforestation as a means of increasing prosperity is assured, and afforestation on the lines suggested would not only pay its way, but bring in a considerable return."

Business Management Necessary.

If for no other reason than because of the 'long-time element' involved, forestry is essentially a business proposition—neither politics nor sentiment can be trusted to maintain over long periods a correct and uniform forest policy. Canadians are most fortunate in the help they may get from their good neighbor the United States in solving their national forest problem—both how to do it, as in their federal forest service, and just as truly how not to do it, as seen today in the great commonwealths of Michigan and New York. New York State's forestry policy is the greatest anomaly I know. The law decrees that not a stick of timber dead or alive shall be cut or used from the state reserves; and yet, while at the one end they are letting all this fine mature timber go to waste and ruin, at the other end they are frantically growing and importing and planting out

millions of little pine and spruce seedlings. There, in the heart of that busy state, one finds fifteen hundred thousand acres of timberland producing no income—a monument to the power of sentiment—a miser's way of conserving resources—all due to bad policy.

No; business management is the sole policy which will stand the test of time, and slowly but surely improve each reserve until it is producing a maximum sustained yield. We hear a lot about 'Conservation' nowadays. What is it anyway? In a speech made one year ago Sir Wilfrid Laurier defined conservation in four words so succinct and comprehensive that they cover the whole ground. He called it 'Wise Use. Wisely Regulated.' Think it over. It applies almost equally well to the so-called non-renewable resources which are mined, as oils and minerals; and to the renewable resources which are cropped, such as fisheries and forests.

Test it on this set of logging rules now being applied to operations on the Riding Mountain reserve. Part of them, as that calling for low stumps, are to ensure wise use of the crop now ready. Others make provision for seed-trees and proper brush-disposal, to provide for a new crop and insure it against fire—that is, present use wisely regulated in order that the future of the forest may be safeguarded, and its producing power steadily increased in quantity and quality as crop after crop is removed. That is true conservation. That is the policy of the Forestry Branch—every acre a producing acre.

If we consider this problem of developing, under a business forest policy, the Riding Mountain reserve for instance, must we not approach it in the same reasonable way a business man would if the land and timber were his and he could count not merely on thirty to forty years of life, but on a thousand years—just

as the present owner, the Canadian people, can?

This business man would regard the reserve as a big tree-farm from which he must produce the largest quantity of the best possible timber in the shortest possible time. To do this he makes use of those two ultimate natural factors of production, sunlight and soil fertility. By patiently fostering the best conditions for these two factors to work together for the production of timber, the Germans and the Japs have built up their magnificent forests: and we in Canada can do the same. The opportunity and possibilities for forestry on the Riding Mountain reserve are splendid, and in this it is only a type of all the reserves in these prairie provinces.

Experiments Needed.

Now, outside of economic efficiency, the ultimate success of such a forest policy must depend, as you well know, upon a close knowledge of the natural laws underlying and controlling all tree life and growth, and our skill in applying this knowledge under given local conditions—in a word, upon the science and art of silviculture.

Forestry practice cannot be adopted wholesale from another country, because our conditions are different; often on two parts of the same reserve they differ greatly. What Canadian foresters need to-day to guide their fieldwork aright is the compiled result from many definite local experiments. We need a number of forest experiment stations.

Isn't it rather odd that the Canadian people maintain some fifteen experimental farms, where experts search out the laws underlying the best local farming practice and how best to apply them, and yet make no study whatever of their forest crop? If all this research is needed in the case of soil products which grow in sixty to one hundred days, how much more for one requiring sixty to one hundred years? Lumbering

is the third greatest industry in Canada, yet as a nation what are we doing to guarantee its future prosperity and permanence? And this seems all the more remarkable when one reflects that fully two thirds of our cropable land in Canada is suited not to the growth of food crops but wood crops.

The explanation, of course, is that up till now the lumberman has not had to grow his crop like the farmer does. He has cared nothing about the cost of production. He has merely harvested an unearned increment. But from now on that condition will change and definite knowledge of the life-history of our trees become more and more necessary. More and more must our lumberman—whether on Crown lands or not—make provisions for future need by planting, rather than by purchase.

The People's Interest.

As the result of a wise land policy our Canadian timberland has not been alienated, so that forestry in Canada will ever be primarily government work, and this is well. As more and more of this cut-over licensed land reverts to the Crown, it—along with the rest of our wild lands—should undergo an expert soil survey and classification, and all that is absolute forest land be made part of our National Forests. (The term 'Reserve' is an unhappy one, because their usable products are not locked up but under due safeguards are for full and immediate use). But whatever the name, let its status as forest land be fixed beyond doubt. Permanence is the very first essential for a forest reserve.

Just let me emphasize in one further word that the people of any forest-supported community have a vastly greater interest at stake in perpetuating that forest wealth than has the lumberman who is exploiting it. For every dollar of profit that lumberman clears, he pays out four for labor, supplies, machinery, transportation and taxes, so that from a

financial standpoint merely and outside of all auxiliary benefits, the general local public have four times as great an interest in making and keeping a given piece of forest permanently productive as has the lumberman who may chance to own or control it.

Look, for example, at the case of the Lake States, Michigan, Wisconsin, and Minnesota. In 1890 their total output of white pine was over nine billion board feet, but in 1910 it had sunk to less than two billion, and as a result more than 500 saw-mills, employing many thousands of workmen, have been forced to cease operations—not to speak of many of the dependent wood-working industries—simply because no steps were taken to make the lumbering industry permanent. The science of forestry was completely overlooked.

The people of those states are now suffering because they thus foolishly allowed—considering the part ruinous taxation played, one might say compelled—the lumberman to mine, instead of assisting him to crop, their magnificent pine forests. Mark you, the lumberman suffered little, for unlike the community he could move away, and he is now repeating his mining operations in the Southern States or on the Pacific Coast. And, speaking of Michigan especially, remember that these timber sharks did not for the most part denude agricultural land, but sandy plains and rocky barrens fit only to grow timber, land which is now an unproductive waste of scrub-oak and brambles, land which for years the state has been vainly trying to sell at ten to fifty cents an acre.

'Oh,' you say, 'that misuse could not happen in Canada where the lumberman does not hold in fee simple but is merely a licensee whom we can easily control and force to do right.' In that saying you voice the all-too-generally accepted fallacy that the lumberman is a sort of felon whom the people must coercively

control to the point of making him lose money for the sake of the future. That idea is surely a wrong one. A lumberman is a useful and useful producer. He is instrumental in transmitting a natural resource into national prosperity and happiness, only he needs to be wisely regulated. The people must form a partnership with him and frankly and fully co-operate according to benefits derived. There is in Canada to-day a great field of opportunity awaiting the genius who will evolve, on equitable principles, a triangular basis of co-operation among the following trinity of interests:

(1) All the people—whether nation or province—sovereign owner of the land, the first factor in production;

(2) The Community—providers of the labor, the second factor in production;

(3) The Lumberman—source of enterprise, capital, organization, the third factor in production.

Such a workable partnership, ensuring conservation by conferring on each interest its proper responsibilities and rewards, is first of all badly needed to-day on our licensed timber lands. Afterwards the methods would naturally be modified and adapted to the management of unlicensed lands and to the encouragement of private forestry. Every Canadian should take an intelligent interest in seeing to it that the future is duly considered in the present use and management of all our Crown and licensed timberlands, whether provincial or federal. The deplorable results in the Lake States and in many of our own forests also, should warn us that it is foolish and most unfair as well to depend on the licensee—for if those Michigan lumbermen who actually owned their cut-over land did nothing, how much more can licensees be expected to do?

Use of Telephone Lines in Fighting Fire

(From American Forestry.)

In fire-fighting a minute may mean millions. To realize the truth of this statement one has only to inspect a trained fire department, used to guard the lives and property, in any city. Most of us are more or less familiar with their time-saving devices; we have admired the splendid horses taught by months of patient labor to spring to their places at the sound of the gong, have seen them harnessed to the truck in the time it takes to press a button, and have observed men drop to their places from the floor above. All this training and expense to save a minute's time in the battle against the fire-demon, in a city where man has used his utmost ingenuity to build so as to thwart the ravages of this element.

Compared with such a well organized system the (U. S.) Forest Service methods seem crude indeed. One man with an axe and shovel guards from 100,000 to 200,000 acres of timberland, worth from \$500,000 to \$5,000,000. In the greater part of these forests nature seems to have invited their destruction by strewing the ground with a carpet of dry leaves and resinous needles, and covering the branches and trunks with moss that, when dry, burns almost as quickly as gunpowder. For one man to attempt, single-handed, to check a conflagration under such circumstances seems worse than foolhardy; and yet, let it be told to the credit of the tribe who wear the Forest Service badge, that when necessity demands they pit their strength and cunning against the flames, and sometimes, aided by night dews and bulldog endurance, win out. The Forest Service records could reveal many such cases of which the public has never heard. It is only when

the battle has been lost and the fire becomes a public menace that the matter gets into print.

It is obvious that chances are all against conquering a fire of any magnitude under these conditions; consequently, every human endeavor is used to prevent the starting of such conflagrations. During the dry summer months a ranger's waking hours are spent in patrolling the routes frequented by travelers, to extinguish neglected camp-fires, and in searching his district with a field glass from some lookout point, to detect the first faint column of smoke that means the beginning of a forest fire.

With so much territory to cover, it is a physical impossibility to have all parts of the district under his supervision at all hours of the day. There will come a time when several fires will start at once. The causes are various; sometimes they are set by lightning from the electrical storms that are common in a mountainous country; more often they are due to carelessness of campers or tourists; occasionally they are started wantonly by some person who objects to the arm of the law, as represented by the forest ranger, reaching back into the wild places; again, it may be that an unextinguished match, or a spark from a pipe or cigarette is dropped in the dry humus, as the hunter or prospector wanders in places remote from the generally traveled trails. The spark ignites the slow-burning duff, which smoulders perhaps for days unseen, the thin smoke being lost in the blue of the spruce tops above it; slowly it burns its way to the resinous roots or mossy trunk of some conifer; the mountain breeze fans it to a flame;

it leaps up and seizes upon the dry twigs and the pitch-laden foliage, the tree bursts into a pillar of flame, and the destruction of the growth of centuries begins. Any of these events may happen any day during the long drought of summer. When they do occur the ranger needs help, and needs it quickly, to save the heritage he has been set to guard.

If he has a telephone the call for help will be in at head-quarters within an hour, and in another the ranger will be at the fire planning his battle and doing all he can to check the flames. At head-quarters the organization that has been perfected for just such emergencies is set to work; by telephone the nearest rangers are sent to his aid; from the lists that have been prepared and kept on file of the available men and horses that can be hired at the nearest settlement, crews and supply trains are organized within a few hours and sent in, if additional help is needed.

With no telephone in his district the ranger must ride to the nearest settlement, where he gathers such help and supplies as possible, with the least loss of time, and returns to the fire after sending a messenger on to head-quarters with the news. But in the meantime hours have been lost that may mean thousands to the nation. I have seen 7,000,000 feet of timber burn in one afternoon because a privately owned telephone line on the national forest was out of repair in just such an emergency as has been described. Several hours were lost in getting a messenger out to the nearest ranger and the news to head-quarters; a crew was organized and sent in without loss of time, but arrived four hours after the fire had broken out of control of the ranger and the few men he had gathered. In this short time it swept the whole mountainside clean. The supervisor bought that telephone line before another season opened.

COMMISSION APPOINTS FORESTER.

The Commission of Conservation has recently added to its staff an experienced forest engineer in the person of Mr. Clyde Leavitt, B.A., M.S. F. Mr. Leavitt has had much experience with the United States Forest Service, with which he was connected from July, 1904, until he resigned to take up his duties with the Commission of Conservation on April 16 last. Mr. Leavitt commenced his forestry studies at Cornell University, under Dr. Fernow, but completed his work at the University of Michigan, from which he graduated with the degree of M.S. F. in 1904, having previously, in 1901, obtained the degree of B.A. from the same university. In 1904 he received the appointment of forest assistant in the Forest Service, in 1907 was appointed Assistant Chief of the Office of Organization (and later Chief), in December was appointed District Forester in charge of the second district, with headquarters at Ogden, Utah, in March, 1910, became Assistant Forester in the Branch of Operations, with headquarters at Washington, D.C., and in April, 1911, was appointed Forest Inspector and assigned to work under Mr. W. L. Hall in connection with the purchase of land under the Weeks Law, which position he held until his recent change.

Mr. J. M. Swann, recently appointed Assistant Entomologist for Forest Insects in connection with the Central Experimental Farm, Ottawa, is spending several weeks in the Riding Mountains (with headquarters at Dauphin, Man.) engaged in study of the insect life of the forests, especially the bark beetles (*Dendroctonus*) of which he has made a specialty.

In the treatment of "camping off," applications of such poles have given good results in the western of the Forestry Branch.

Measures for the Prevention of Forest Fires.

From the German of Dr. M. Kienitz, Royal Forester and Professor of Forestry at the Forestry Academy of Eberswalde; translated by Ellwood Wilson.

Fire is one of the greatest dangers of the forest, not only for a virgin stand with its litter of dead trees and fallen dry limbs, but also for a cultivated forest with its thick even-aged stand which in its youth is so easily destroyed by fire.

A forest fire is absolutely dependent on the inflammability of the ground cover, and if this consists of green herbs or if it is entirely removed so that the mineral soil is exposed a fire is impossible.

Every fire has a small beginning, burning at first in dry moss, grass, fallen leaves or needles, without harm to the trees, until, according to the amount of combustible material and the character of the stand, it sooner or later strikes into the crowns and the whole forest sinks in a sea of flame. Arrived at this stage, a conflagration knows no boundaries, the crown fire rushes ahead of the ground fire, leaps over great obstacles, showers burning sparks across water-courses or meadow-land, kindling new fires on the farther side. A crown fire can only continue to burn if the ground fire follows it and if the flames can continually rush up the trees. If the ground fire loses combustible material over a wide strip, the top fire goes out. On these facts are based our methods of fire-fighting.

Extinguishing Forest Fires.

It is easy to put out a fire just started, a green branch covered with leaves or needles swept over the ground in the opposite direction to that in which the fire is travelling, not beaten up and down on the flames, soon drives back and extinguishes it. Once the flames are out, all glowing coals must be smothered by stepping on them, beating them out, or covering them with earth, or the fire can be confined by a furrow made with a grub-hoe, spade or plow, throwing the earth toward the fire.

The same principles apply to large fires as long as they are ground fires; but it may happen that the heat is so great that near approach is impossible or the number of men available too small to cover the front of the fire. In that case it must be gradually reduced by fighting from the sides until it is conquered. (See Figure 1.) The newly extinguished places behind the fire must naturally be watched to prevent it springing up anew behind the fighters. If the fire has already reached the crowns, these means will be of no avail and a back-fire must be started.

A back-fire can be used where the front of an oncoming fire gives an opportunity to light a row of small fires which can burn towards the main one without spreading backwards. Good places are roads, trails, railway lines, brooks, moist hollows where the grass is green, etc. Naturally the back-fires burn into a closed line against the wind, slowly along the ground, and without catching into the tops and except in very young stands will do no material damage. As soon as the back-fire reaches the wind-driven main fire it will be seized by the rising air current, and will be carried into the tops against the latter, with which it will unite. This meeting kills both fires because there is nothing in the path of the fire on the ground to burn, and the crown fire, having no nourishment, dies out.

Preventive Measures.

In cultivated forests places to start possibly necessary back-fires should be provided at the time of planting. In favourable situations strips fifteen feet wide must be left bare and in seasons of especial danger they must be kept bare by plowing or digging. These strips answer the purpose excellently. The loss of ground is trifling, as fifteen feet is soon practically covered by the meeting of the crowns in middle age. Besides they serve as roads for removing thinnings, or they can be sown with fodder crops,—saradella, for instance, which furnishes food for game and prevents deer from feeding on young trees.

In well regulated forests, it is not sufficient to make rules for extinguishing fires, but means must be taken to see that no fires start. Police and legal regulations practically prevent fires started by human agency. In countries like Germany, where the knowledge that it is necessary to protect and care for the forests has penetrated to practically every class of the population, it has become possible steadily to decrease the number of fires set through malice and carelessness. Regulations requiring every dweller near a forest to help fight fires without pay are willingly obeyed by the majority, and in countries where conditions are as favorable as they are in Germany, the number of fires would yearly diminish were it not that one circumstance increases them.

The Railway Danger.

This is the growing number of new railways through the forests and the steadily growing traffic on those already built. Every



Fig. 1—Method of Chaining a Forest Fire. *

engine using a fuel which throws off sparks (coal, peat, wood, etc.) is dangerous. In the pamphlet published by the Hawaiian State Railway Commission in 1903 treating of the Prevention of Forest Fires, it is especially stated that in spite of all efforts to the contrary, engine-builders have been unable to devise any practical means to prevent sparks being thrown off by locomotives. They have succeeded in making fireboxes tight, which prevents the dropping of coals, but these latter are not only dangerous, falling as they do, on the track. It is the glowing coals, which fly from the smoke-stacks which are especially dangerous and cannot be held back without interfering with the draft, also in especially the case with fast trains. Patrolling the right of way is also no longer possible, as the number of trains has so increased, and one locomotive on a trip can set numerous fires in rapid succession in highly susceptible places.

It is therefore necessary to provide the way as much as possible by some arrangement which will not unduly restrict speed, which will not be too expensive, and which will not be too complicated. For this purpose the use of chains of well-chosen trees and shrubs or bushes such as are found together, growing close, with all centers, by which the fire can be held back and the fire would be reduced to a minimum. It has been found by experience that keeping the trees close, or well back in a regular line of planting the spread of fire. The danger from sparks is in proportion to the size of the rather particles, the amount and direction of the wind and the susceptibility of the ground-wood.

The larger the sparks, the more likely they are to start a fire, but the smaller the sparks that are carried, the greater the danger in landing on the surface of the wood, but the danger is also greater over the

track. If the forest floor cover is only slightly or with difficulty inflammable, it is sufficient to keep bare a strip between the right of way and the woods, so that a fire starting cannot pass it; even this is sometimes not necessary as the light far-flying sparks are not dangerous.

Protection of Pine Forests.

The conditions are quite different if the railway crosses a wood with highly inflammable ground-cover. There is especial danger for extended stands of pine on poor dry soil. In such stands, the danger lasts nearly all the year, and the flames, running swiftly over the ground, easily reach the crowns; they are safe only as long as the snow is on the ground, or as long as it is raining. In these stands, as well as all others, in which there is a large amount of easily inflammable, dry material, special precautions must be taken. Ordinarily these consist of treeless spaces, which are either used as farming land or planted with hardwood managed on short rotation. But on dry forest soils, where the danger is greatest, hardwood will not grow, and farming does not pay, in which case broad, entirely unused strips are left on both sides of the right of way, which must be plowed each year, entailing expense and bringing no return, and sometimes also entailing danger to the railway through drifting sand.

Protection Strips.

If these strips are needed to stop sparks, they must be very wide. A width of ninety feet on either side does not protect, for Burkhard has observed that sparks have set fire 240 feet from the track. But a strip 33 feet wide and a quarter of a mile long contains one acre, therefore a strip 33 feet wide on each side of the track would mean eight acres per mile, not only lying useless, but in some cases increasing the danger of fire, as it has been proved that where a railway runs through a forest which lies close to the track, there the danger is, on the average, less than when the woods are farther away. If the trees are close the wind is compelled to follow along the narrow lane of the track, while if the trees are farther away, the wind can blow from the side and drive the sparks among the trees.

To overcome these disadvantages, and to protect the forest from the danger of fire from locomotive sparks, it is necessary to manage the wood near the track, and to prepare a strip on which all fire will die out before it can set fire to the crowns, or kill the trees, and at the same time catch all sparks. The glowing sparks are rather large and fall immediately to the ground as soon as they strike the still air stratum inside the protection stand, just as snow-flakes fall behind a hedge or sand-clouds behind fences and grass tufts. The protection strips, which the author of this pamphlet has recom-

mended for pine forests of North European plains, answer a double purpose. They permit the use of woodland right up to the track, even in districts most subject to fires, protect the track from drifting sand, and are relatively cheap to keep up. They consist of strips of trees, 36 to 45 feet wide, which have a bare ditch or path 4.5 feet wide toward the forest, and a strip, 3 feet wide, of bare ground next to the track. The two bare strips are joined by foot-paths, kept bare, every sixty or ninety feet.

As mentioned above, every fire starts from a small beginning, which cannot harm the trees, and is dangerous only when it has succeeded in spreading. Very often the dry grass or moss on the railway embankment catches, and has quite a large front by the time it reaches the edge of the woods, and that it may not spread over into the wood, the edge of the wood is kept bare for three feet. Then the fire goes out. The glowing sparks which fall directly on the strips of wood beyond the first bare place can start only small fires, and if these spread, they must die out on reaching the second bare strip of 4.5 feet, or one of the cross lanes.

Wooded Strips to be Narrow.

Care must be taken that the fire on the protection strips never reaches the size of a crown fire, and thus spreads over the bare strips. This end is achieved by the narrowness of the wooded strips. If there is not much fuel on the ground, a fire 36 to 45 feet from its origin is not high; height comes only when a fire has reached deeper into a forest, over a larger surface, which much increases the heat. The amount of inflammable material on the protection stand, both on the ground and above it, must be kept down as much as possible; all dry branches, weeds, juniper and other inflammable objects must be removed; suppressed and dry branches of the trees up to breast-height must also be pruned off. Only the green branches on the edges of the stand must be kept as near the ground as possible. The closer the green branches are on the side toward the track, the better the protection strip fills its second important purpose, i.e., to stop the lighter far-flying sparks.

To attain this end, the stand on the protection strips must be closed and without large gaps; a stand which is too thick is not favorable, for between the close standing trunks, the flames easily rise higher than where the trees are not so close, and crowded trees do not develop good crowns.

Since very old stands become too thin and the high trees are likely to be thrown on the tracks by storms, or at least may damage the telegraph lines, it is necessary to choose a short rotation for protection strips. In determining this rotation, the first consideration is the purpose of the protection stands; the second is the yield. The rotation

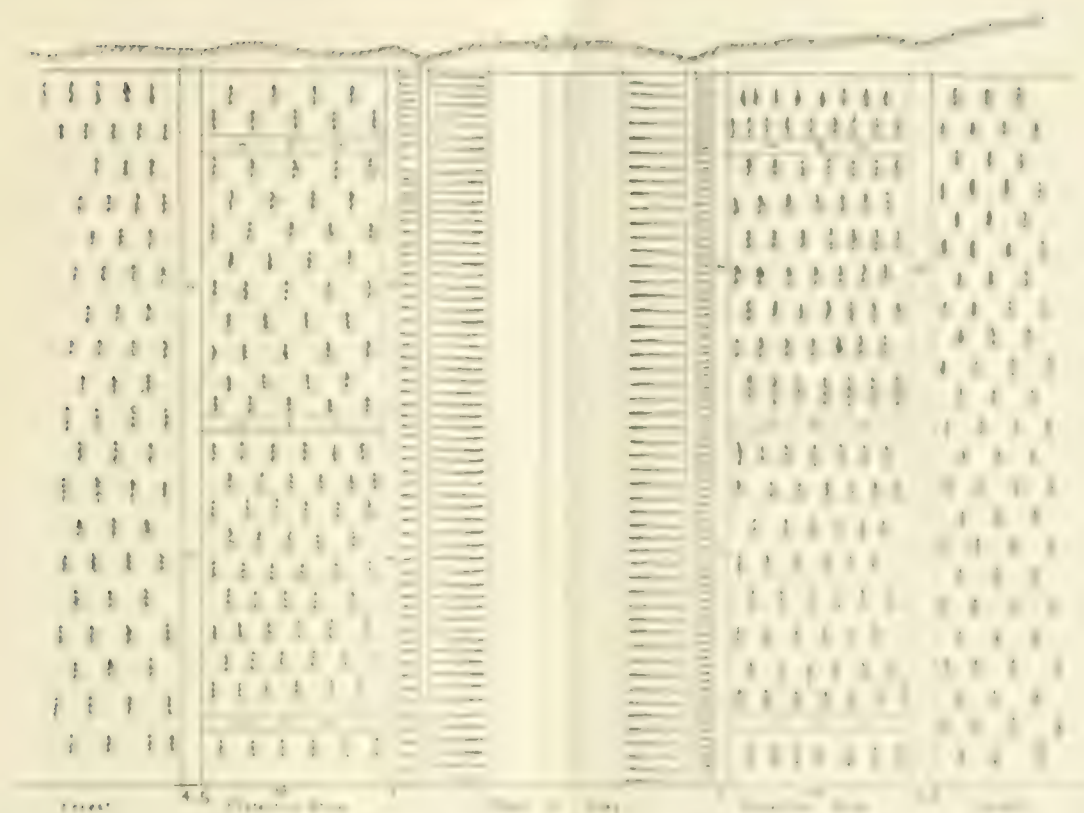


Fig 2.—Right of Way With Protection Strips on Both Sides.

W — STRIPS OF HARD EARTH

of strips in pine on sand must be between sixty and eighty years. A too short rotation is to be avoided, for a strip only becomes of use when it reaches a height equal to that of the funnel of the locomotive.

Since the danger of sparks flying far is especially great if the wind finds nothing to check it on either side of the track, therefore both sides of the right of way must never be cut at the same time, at least one side must be left. The strips behind the protection strip, too, must not be cut and replanted as long as the protecting trees are so low that they do not fully prevent sparks from flying over them.

If reforestation must take place behind an insufficient protection system, then a second protection strip must be laid out exactly like the first, and be kept up until the first strip is a sufficient protection.

Cuts, Curves and Fills.

The danger is least if the road runs through a cut that is so deep that the top of the smokestack does not reach above its edge. In this case, a strip three feet wide between the edge of the cut and the road is enough. Since, however, these deep cuts are generally short and the air currents are difficult to judge, it seems in most cases necessary to carry the 30-foot protection strip past these also.

The danger is especially great on the convex side of curves. Often from the direction

of the railway or the wind as best of the prevailing wind, when in the curve they do not combine with the wind that the sparks are thrown in large numbers against the protection strips. It is of such effect that the strip must be high, and the trees of simple bulges for the number of sparks makes no difference, as even a rapidly passing train cannot send out enough to get far directly to the crown.

The danger is also great when the line passes along a high hill, where the full force of the wind strikes the funnel. It cannot be denied that in such places the sparks are far further than in a level section, because they take longer to reach the ground, but the danger is not so great as might appear from a superficial consideration. The wind can throw the sparks into the road only if it strikes the railway at an angle, and when it reaches the lee side of the embankment it falls, covering the sparks down wind, and these fall faster and reaching the still air rapidly settle to the ground. Some on railways the 30-foot strip is made three feet high to six feet high, or the protecting strip is made of 4-centimeter trees from the back, but one that will grow three feet high in six feet from the track. The same is the protecting strip can stop the sparks just as well as those which is a good reason, and even to the track. If they are only high enough. The distance and grow not sufficient.

Only if the protecting strips are young, it is safer to have a second strip, 36 feet wide and arranged like the first, kept up behind it.

When a new railway is built, a menaced stand will be handled like any other forest, i.e., only a broad enough lane will be made for the right of way, and on both sides a protecting strip as described above. The forest is not changed except to clean up the ground, remove all material which in burning would generate much heat, as dry twigs, heather, etc. At the edge of the road-bed and on the outside of the forest toward the protection strip, the ground must be cleared entirely, 4.5 feet wide, so that the mineral soil will prevent any spread of the ground fire. The trees on this 4.5 feet strip may be left; they must, however, be pruned so that the yearly clearing of this strip can be done by horse-drawn harrows.

If the timber on a protecting strip must be cut off on account of overmaturity, the strip must be replanted immediately. The protecting strip on the other side of the track, as well as the forest lying next to the strip to be lumbered, must not be cut until the young growth has reached a height sufficient to prevent a transverse wind from blowing the sparks into the forest.

Choice of Species.

The kind of trees to be chosen for planting must satisfy the following conditions:—

(1) The trees must be adapted to the soil, so that they start well and continue to thrive.

(2) They must form a thick bark early, so that they will not be killed by ground fires.

(3) Their crowns must be thick enough at all seasons to catch flying sparks and to shade the soil in order to prevent a thick growth of grass.

According to a current opinion, hardwoods are better than pines; this view is based on an incorrect observation. Where hardwood thrives, as a rule the ground is fresher and the fire risk less than where pine grows. The young pine, one inch in diameter, is safer from a running fire than the same-sized hardwood tree (beech, oak, birch) because it early forms a thicker, non-conducting bark than the other. Its crown is a better spark-arrester, because it is green in the danger season, spring, before the leaves of the hardwoods have appeared. It must, however, be pruned to a sufficient height to prevent a weak fire striking up into the crown. For the narrow protecting strips, pruning up to 3 to 4.5 feet is sufficient.

On the dry sand of the North European plains the common pine is the only indigenous tree which forms a safe protecting stand. In other forested areas, there are evergreens which have the same resistance to fires, and are suitable as *Pinus silvestris*.

Formation and Care of Strips.

Sowing is the best way to start a stand, for the main object is to have strong even-growing plants, and it allows us to keep the ground between the plants clean for several years. If the ordinary pine is chosen, it is best to plant in rows parallel to the track 3 ft. 6 in. apart; in the rows, 18 inches is the spacing for strong one- or two-year-old pines. If possible, a little good soil should be put in the holes. Strong plants with well-balled roots, or three-year-old transplants should be set three feet apart. Between the rows a horse harrow should be used once a year, so that if a running fire starts in the young growth, it will go out at once. If the ground is too rough for horses, it must be bared by hand. This harrowing must be kept up until the stand is so high that ground fires cannot catch in the tops. In order to reach this stage as soon as possible, the lower, dry and suppressed branches are cut off as soon as the pines are three feet high; only on the outside row are all the branches left, so that they form a mantel reaching nearly to the ground to catch the sparks.

Simultaneously with the pruning, all superfluous trees are cut, i.e., those which stand too close to another tree. In their early years, a spacing of 3 ft. to 3 ft. 6 in. is about right. Later all suppressed trees are cut, so that only thrifty trees with thick crowns remain. By means of the thick close crowns the undergrowth of grass, lichens, etc., is prevented, so as to furnish little nourishment to a ground fire, which then runs harmlessly through. It is desirable that these protecting strips should burn often, so that no accumulation of fuel can occur to be dangerous for a later fire. If there is no fire for a year from sparks, the advisability of setting a fire under favorable weather and wind conditions (toward the track) to burn the ground-cover, should be considered.

As soon as it becomes impossible to work the ground between the rows, precautions should be taken that a fire catching in the protecting strip does not run into the stand to be protected. For this purpose, before mentioned, the bare strips are laid out, whose surface must be made fireproof, each year, by raking off inflammable matter or by working the soil. On the woodward side, the strips are 4.5 feet wide, and those toward the embankment and the right-angled strips 3 feet.

This baring of the soil can be well accomplished by using a spring harrow. In this case the bare strips must be arranged so that the animals drawing the harrows can work uninterruptedly, and a uniform width of six feet should be chosen. A form as shown in the sketch is good. The

(Concluded on Page 81).

Canada's 1911 Pulpwood Consumption.

The Forestry Branch of the Department of the Interior has finished the compilation of the statistics of pulpwood consumption for 1911, and will shortly publish the results as their Bulletin No. 30.

The consumption of pulpwood showed an increase of 73,801 cords (or 12.3 per cent) namely, from 598,487 cords in 1910 to 672,288 cords in 1911. The average price per cord (\$6.45) was the highest paid since these statistics began to be compiled in 1908. The increase in the production of pulp was 22,229 tons, viz., from 474,604 tons in 1910 to 496,833 tons in 1911 (an increase of 4.7 per cent). Fifty-four firms sent in reports, an increase of three.

Quebec mills, 28 in number, consumed 38 per cent of the total quantity of wood used; Ontario, with fourteen mills used almost one third; the four mills in New Brunswick took 6.8 per cent of the total and Nova Scotia's seven mills about half that quantity. The actual quantities of pulp consumed are as follows: Quebec, 390,426 cords; Ontario, 211,007 cords; New Brunswick, 45,824 cords, and Nova Scotia, 22,221 cords. Pulp manufacture in British Columbia is still in the experimental stage.

The effect on the price of pulpwood of Quebec's prohibitory regulations as to export of wood cut on crown lands has been awaited with interest. The conclusion to be drawn from the figures of the bulletin is that an increase of almost one dollar per cord has resulted. The average price paid for pulpwood in Quebec in 1911 was 97 cents per cord greater than that paid in 1910. In Ontario the price fell twenty cents, while New Brunswick and Nova Scotia show increases of twenty to thirty cents per cord.

Spruce is still far in the lead as a pulpwood, over four-fifths of the wood used being of this species. Slightly less than one fifth of the total consumption was balsam fir, and poplar and hemlock each furnished less than one per cent of the total. The proportion of balsam fir used for pulp is constantly increasing.

Only four species—namely, spruce, balsam fir, poplar and hemlock—were used for pulp in 1911. Quebec used all four; Ontario and Nova Scotia all but hemlock, and New Brunswick only spruce and balsam fir. The proportions of the two principal woods to the total consumption in the various provinces were as follows:—Quebec: spruce, 75 per cent, balsam fir, 24.3 per cent; Ontario: spruce, 90 per cent, balsam fir, 9 per cent; Nova Scotia: spruce, 80 per cent, balsam fir, 18 per cent; New

Brunswick: spruce, 96 per cent, balsam fir, 4 per cent.

Of the processes the mechanical made 60.1 per cent of the pulp manufactured and made by the process. Thirty-two per cent of the pulp was produced by the sulphate process, and about eight per cent by the soda process.

Quebec leads in the production of mechanical and soda pulps, and Ontario in the manufacture of sulphate pulp.

The proportions of the different woods used in each province are as follows:—

	Mechanical	Sulphate	Soda
Spruce ..	57.2%	28.8%	4.7%
Balsam Fir ..	76.0%	23.1%	0.7%
Hemlock ..	24.0%	0.0%	41.0%
Poplar ..	0.0%	71.0%	41.7%

In 1911, 72.9 per cent of the pulp made was produced by the mechanical process. Nova Scotia used this process exclusively, and over half of Ontario's pulp is produced by the method. New Brunswick, on the other hand, manufactures 94.6 per cent of its pulpwood by the sulphate process, with the remainder divided almost equally between the other two processes.

The average consumption of paper per mill in the Dominion was 7,616 cords, almost the same as that for 1910 (7,540 cords), and quite an increase over that for 1910 (41,700 cords). Quebec gave the highest average cut per mill, viz., 12,000 cords.

The aggregate export of wood pulp was 1,514 tons, of which 1,100 tons was mechanical pulp and 414 tons chemical pulp. The total value of the pulp exported was \$4,000,000, an average value of \$2,640 per ton. In 1910, 2,28,917 tons of pulp, valued at \$5,694,800, were exported. The mechanical pulp was worth \$2,000,000, or \$17.34 per ton, and the chemical pulp \$1,600,000, or \$3,820 per ton. The mechanical pulp was valued 80.5 per cent of the export, and the chemical pulp 19.5 per cent. The total value of the pulp exported was 1,100 tons, of which 1,100 tons was mechanical pulp and 414 tons chemical pulp. The total value of the pulp exported was \$4,000,000, an average value of \$2,640 per ton. In 1910, 2,28,917 tons of pulp, valued at \$5,694,800, were exported. The mechanical pulp was worth \$2,000,000, or \$17.34 per ton, and the chemical pulp \$1,600,000, or \$3,820 per ton. The mechanical pulp was valued 80.5 per cent of the export, and the chemical pulp 19.5 per cent.

While exports of wood pulp decreased by 33.4 per cent, the domestic consumption in the United States increased over four times in 1911. The total consumption of wood pulp in the United States was 1,100 tons, of which 1,100 tons was mechanical pulp and 414 tons chemical pulp. The total value of the pulp exported was \$4,000,000, an average value of \$2,640 per ton. In 1910, 2,28,917 tons of pulp, valued at \$5,694,800, were exported. The mechanical pulp was worth \$2,000,000, or \$17.34 per ton, and the chemical pulp \$1,600,000, or \$3,820 per ton. The mechanical pulp was valued 80.5 per cent of the export, and the chemical pulp 19.5 per cent.

successfully competing with Canadian pulp, probably owing to the lower cost of labor in these countries and perhaps, also, to the fact that smaller profits may be satisfactory to capital. The home market, also, has increased its production by some forty per cent since 1908, when it took 34 per cent, and in 1911 took almost 48 per cent.

Canada now supplies approximately half of the United States import of pulp. Less pulpwood in the unmanufactured state was exported in 1911 than in any year since 1907. The decrease is confined to Quebec, which sent to the United States over 140,000 cords less pulpwood than in 1910; Ontario and New Brunswick, on the other hand, have both increased their imports to the United States. Still, of the 1,520,227 cords of pulpwood produced in Canada in 1911, considerably over half (nearly 56 per cent) is exported unmanufactured, the quantity being 847,939 tons. The total value of the pulpwood produced was \$9,678,616, that of the pulpwood manufactured in Canada \$4,338,024, and that of the export being \$5,340,592. Had Canada manufactured into pulp the pulpwood she exported, she would have received, instead of the \$5,340,592 she actually got, approximately \$15,000,000. The pulpwood thus exported would have supplied sixty eight mills of the average size of those operating in Canada, and the Dominion, instead of having fifty four pulp-mills, would thus have a hundred and twenty two; Quebec could supply, with her export, forty five mills of the average size operating in the province, and New Brunswick could double her number.

Imports of wood-pulp nearly doubled in value, namely, from \$49,000 in 1910 to \$94,000 in 1911.

U. S. FOREST RANGER QUALIFICATIONS.

The requirements and duties of forest rangers on National Forests in the United States are thus described in 'The Use Book,' which contains the regulations and instructions for the use of the National Forests:

'A ranger of any grade must be thoroughly sound and able-bodied, capable of enduring hardships and performing severe labour under trying conditions. He must be able to take care of himself and his horses in regions remote from settlement and supplies. He must be able to build trails and cabins, ride, pack and deal tactfully with all classes of people. He must know something of land surveying, estimating and scaling timber, logging, land laws, mining, and the live-stock business.

'On some forests the ranger must be a specialist in one or more of these lines of work. Thorough familiarity with the region

in which he seeks employment, including its geography and its forest and industrial conditions, is usually demanded, although lack of this may be supplied by experience in similar regions.

'The examination of applicants is along the practical lines indicated above, and actual demonstration, by performance, is required. Invalids seeking light out-of-door employment need not apply. Experience, not book education, is sought, although ability to make simple maps and write intelligent reports upon ordinary forest business is essential.

'Where saddle horses or pack horses are necessary in the performance of their duty, rangers are required to own and maintain them. The Forest Service furnishes no personal or horse equipment.

'Rangers execute the work of the National Forests under the direction of Supervisors. Their duties include patrol to prevent fire and trespass, estimating, surveying, and marking timber, the supervision of cuttings, and similar work. They issue minor permits, build cabins and trails, oversee grazing business, investigate claims, report on applications, and report upon, and arrest for, violation of forest laws and regulations.'

The examination consists of questions regarding the use of the forest, supplemented by a field test to show the applicant's fitness to do the actual work of a ranger. Education and experience are rated on the answers to the questions on these subjects in the application form and on the applicant's use of English in the written test. Horses for the tests in riding and packing are provided by the Forest Service.

The examination is under the control of the Civil Service Commission, and not of the Forest Service.

The law requires that, when practicable, forest rangers must be qualified citizens of the State or Territory in which the National Forest on which they are appointed is situated. Since the list of local eligibles must be exhausted before eligibles residing in other States can be appointed, the chance of citizens of outside States who go to the National Forest States and take the examination to secure an appointment is small.

The per capita lumber production in Canada in 1909 was about 684 board feet, probably the greatest in the world. The per capita production in the United States in 1909 was 470 board feet. It is probable that with an increased demand due to forest depletion in other countries, with the development of transportation system to northern forest regions, now inaccessible, the forest production of Canada will still further increase even though it has already reached proportions which under present systems of administration the forest of this country cannot permanently support.

Measures for the Prevention of Fire

(Concluded from page 78.)

place for the strips to be bared must be chosen when planting.

The laying out and keeping up of the protection strips naturally costs something, and the strips are only a sure protection if carefully kept up. But the cost of this system is far less than the sacrifice, which must be made to keep up the heretofore little-useful, bare protecting strips, used in North Germany, and a management used, as is the railway, to install all means for safety of passengers and to run its business with the most painstaking care, will easily carry out the relatively simple rules laid down here. The wood-owner must strive to protect his forests from devastating fires, and it will be to his own interest as well as that of the country in general to co-operate with the railway management.

PAY MORE FOR PULPWOOD.

The Montreal correspondent of the Paper Trade Journal, one of the leading journals of the paper trade in the United States, sent to that journal lately an interesting note on the effect of the prohibition of pulpwood export. After noting the fact that it is only recently, for the first time, that the United States mills are compelled to come to Canada for their supply, and the reasons for this, the despatch continues: 'They find that the price has advanced practically \$1 per cord, and they are now forced to pay from \$7.50 to \$8 for peeled wood cut on free lands. This extra dollar charged for pulpwood will mean an extra dollar charged for their pulp. This gives the Canadian paper maker so much of an advantage. The indications are that the price of raw pulpwood will continue to increase from year to year owing to this scarcity, which will result in further advantages to the Canadian manufacturer, and eventually his absorption of the entire market. The real significance of the whole matter is found in the fact that this is the first real test of the working of the Gouin law, and it is proving itself to be an admirable and advantageous thing for the Canadian pulp and paper manufacturer.'

Forestry seeks not only to protect the destruction of the forests but to secure their improvement so that they will be fit a production to produce each year, without any lowering of their value, even greater crops than they have yet produced under methods of exploitation. To secure this result forestry must achieve fire protection, prevention of waste in the logging, scientific use and care of lumber, and the reforestation of burnt and cut-over lands.

AN ONTARIO FOREST SURVEY.

During this coming summer the Commission of Conservation will conduct a survey of a portion of Haliburton county and the northern part of the county of Peterborough, Ontario. This survey is to furnish a detailed description of the economic and natural conditions and resources of the watershed in Peterborough and Haliburton counties feeding the Trent canal waters and to serve as a basis for a plan of management. The entire area is about 1,500 square miles in extent.

The survey is under the superintendence of Dr. B. E. Fernow, the field work being done by Dr. C. D. Howe and Mr. J. H. White, with three students. The survey was started during the fourth week of May, in the township of Marmora (Hastings county). This is at the south-east corner of the area to be surveyed, which includes all the townships north of Sturgeon and Stony lakes, as far west as Victoria county.

The information especially sought is the distribution of farm and forest lands and of forest types. The first object of the survey is to secure detailed information, not only of natural conditions, but also of ownership and economic conditions of the country surveyed.

The Dominion government has a distinct interest in the part of the country to be surveyed, owing to its having spent several million dollars, during the construction of the canal, on the building of dams and for means of conserving the waters of the region, without controlling the watersheds. Hence the reason for the Commission of Conservation undertaking the work.

With every acre of woods bearing a growth of several thousand square miles of forest growth and of economic and scientific value, the knowledge of the conditions of the country, the forests, and the land, will be of great value to the Dominion government.

Use of Telephone Lines in Fighting Fire

(Concluded from page 73.)

While the principal reason for building these lines is for fire protection, they pay for themselves in other ways by facilitating the business and administration of the forest. Hardly a week passes but the ranger finds it necessary to communicate with his supervisor upon some matter of business. Mail routes are scarce in these remote districts. To get to head-quarters he may have to ride one hundred miles, or even more. This means several days of labor lost, to say nothing of the risk of leaving the district without any patrol. With a telephone the matter can be settled in fifteen minutes and the ranger does not leave his work.

During the summer months the forests are used to pasture thousands of head of sheep, cattle and horses, that are trailed for scores of miles to these summer pastures. The telephone is a boon to the owner in enabling him to keep in touch with his foremen and outfit.

This is why the Forest Service spends thousands of dollars of its appropriation each year in the construction of telephone lines. Besides those built and owned by the Service they have the free use of many miles of telephone built by settlers in co-operation with the Service. Free right of way and poles are granted to any company, corporation or private party to cross the forests with such lines; in exchange for these privileges the Forest Service asks the right to connect its lines, or to place an instrument where needed. Settlers and miners are glad to have an instrument placed in their cabins free of charge, the only fee required being that they notify the rangers of any smoke seen in their vicinity. Often an abandoned telephone line, that has been built into a once prosperous mining camp, is purchased or leased at small expense. Temporary lines are often strung to some

lookout point, where the instrument is placed in a box and nailed to a tree; such lines are generally strung on trees or brush and taken down when the season is over.

A comprehensive plan for a telephone system has been worked out for each forest; few of these have been completed to date, but something is being added to them each year as appropriations are available. With their completion, and an increased force for patrol during the dry season, a serious forest fire on the national forest will be a rare occurrence.

The Forestry Division of the Laurentide Co., (Grand Mere, P.Q.), is this spring planting 15,000 seedlings, having in view the re-stocking of cut-over lands near their mill. A forest nursery will also be established. Mapping and valuation survey work will be continued.

The Timberman (Portland, Ore., U.S.A.,) reports a number of forest fires in the states of Washington and Oregon. The early part of May was very dry, and hence the season was favorable for forest fires. Five lives were lost in a fire which destroyed one logging camp. Nine camps and one mill, besides other property, are also reported destroyed.

The College of Forestry of the University of Washington is to have a demonstration forest; it will fill the double purpose of an experiment station and a field laboratory in which the students of the college may carry on work.

A press despatch, dated May 28, from Prince Albert, Sask., stated that bush fires had been sweeping the country north of the River Saskatchewan for two weeks before that date. One house belonging to a settler had been destroyed, and a survey camp of the Canadian Northern Hudson Bay railway burned.

With the Forest Engineers.

DOMINION FORESTRY BRANCH NOTES.

The Forestry Branch of the Department of the Interior will this summer have several parties in the field. Work is being taken up in a couple of regions in which no forestry work has so far been done. In one of these, viz., the Lac la Biche country, in the province of Alberta, Mr. S. H. Clark will be in charge of the work. Another new region is south-eastern Manitoba, where Mr. L. C. Tilt will be in charge of a survey party, with Mr. F. S. Newman as assistant. Mr. W. L. Scandrett will take up the work begun last summer by Mr. W. J. Vandusen in the Pasquia Hills district, where an addition to the Porcupine forest reserve is contemplated. Messrs. Geo. Tunstall and A. E. Parlow will also be members of this party. North of Prince Albert another exploring party will operate under Mr. C. H. Morse, with whom is associated Mr. W. J. Boyd. Mr. J. A. Doucet will survey the country southwest and west of Lesser Slave Lake, continuing Mr. Cameron's work of last season; with him will be Mr. V. C. Clark. They will enter the country by way of the Peace River trail from Edson.

Mr. D. Roy Cameron has been appointed Inspector of Dominion Forest Reserves in the Railway Belt of British Columbia, with Mr. S. H. Irwin as his assistant; Mr. Irwin will also make inspection of lands to be included in forest reserves in the upper country.

On the east slope of the Rockies Mr. J. R. Dickson, for some years forest assistant in the Riding Mountain Forest Reserve, in Manitoba, has been appointed supervisor of the Crownest Forest Reserve

with headquarters at Pinet Creek and will have as his assistant Mr. C. McFayden.

On the Bow River forest reserve Mr. T. W. Dwight is at present acting supervisor in the absence of the supervisor, Mr. A. Helmer. Mr. T. G. Edgar has been assigned to the reserve as forest assistant.

Mr. G. H. Edgcombe is supervisor of the Brazeau reserve and Mr. R. M. Brown is forest assistant for the reserve.

Mr. W. J. Vandusen is at present assisting Mr. W. N. Miller, Inspector for Alberta.

Mr. L. R. Andrews has been appointed forest assistant on the Riding Mountain reserve, in place of Mr. J. R. Dickson.

Mr. F. K. Herthmer has been appointed Inspector of Forest Reserves for the province of Manitoba.

The list of officers of the Canadian Society of Forest Engineers for 1912 shows no change from that of 1911, all the officers being re-elected. The list is as follows—

President—Dr. B. E. Kroow
Vice-president—R. H. Campbell
Sec. treas.—F. W. H. Jacombe
Executive Committee—H. R. MacMillan and Ellwood Wilson

Mr. H. R. MacMillan has accepted the position of Chief Forester of the Department of Lands of British Columbia.

Mr. R. D. Craig, formerly Inspector of Dominion Forest Reserves, is now in business in Vancouver, engaged in buying and selling timbers and making forest surveys for private owners.

Mr. A. Knechtel, Inspector of Forest Reserves, visited Fredericton, N. B., in April, as representative of the Forestry Branch, spending the week from April 4 to April 10 in examining the timberland belonging to the University of New Brunswick, in company with Prof. R. B. Miller, and conferring as to the policy to be adopted in the treatment of the tract. As a result of the conference, a forest working plan will be prepared and a strip survey has already been started as a preliminary to this. Studies for volume and yield tables will be prepared next fall on tracts adjoining the property, and thus the cutting of the University's forest will be rendered unnecessary. A trail will be cut along the boundary at one side of the tract; certain necessary cleanings and thinnings have already been begun.

Kenneth R. Machum, of the junior class of the U. of N. B. forestry department, is working with the forestry branch of the Canadian Pacific Railway's new department of natural resources.

Prof. R. B. Miller, of the University of New Brunswick, in a recent newsy letter to the Editor, gives interesting notes of activities in the Maritime Provinces. An important part of his spring's programme has been the supervising of a plantation of 15,000 Norway spruce seedlings on land belonging to the Rhodes Curry Co., at Little River, N.S. The stock used was three-year-old transplants, strong and hardy stock, secured from Ostermann & Sons, Germany. A tract of some ten acres was laid off in a burned area and all debris removed. A fire guard will be plowed around the plantation and a fence erected to keep out the deer. He also supervised the planting of several hundred ornamental trees on the summer estate of Mr. N. Curry, of Montreal, president of the Canadian Manufacturers' Association, at Tidnish, N. S. Work in prospect at the time of writing included a summer camp on

the college lands for a short time, followed by the oversight of a party of students making an estimate of 3,000 acres for private individuals in the province. After a short visit to Prof. Hawley and a party of Yale Juniors engaged in some timber-marking work near Woods Lake Siding, in the Adirondacks, New York State, for the International Paper Co., he will spend the summer at his home in Indiana. He considers the prospects of the forestry department decidedly encouraging.

Mr. R. R. Bradley, of the New Brunswick Railway and Land Co., will have a party of three U. of N. B. students with him this summer.

Mr. A. H. D. Ross will again spend the summer in the employ of the Canadian Pacific Railway Company as consulting forester.

Foresters now in British Columbia include Dr. Judson F. Clark, and Messrs. R. D. Craig, H. C. Wallin, A. S. Williams, L. Margolin, H. C. Kinghorn and P. L. Lyford.

Asa S. Williams, F.E., is British Columbia agent for the Allis-Chalmers-Bullock Co., manufacturers of logging machinery. Business seems to be pretty good, as he has just sold three more over-head skidders for Vancouver Island. Former ones have proved very successful in handling the heavy Coast timber.

Mr. Overton W. Price, former Assistant Forester for the United States, is now in British Columbia, acting as consulting forester for the B. C. government in the organization of their forestry department.

The United States took 63.8 per cent. of the mechanical wood pulp and 95.7 per cent. of the chemical wood pulp exported from Canada in 1909.

The fire at Porcupine is a repetition of the story that has become common wherever standing timber is still to be found. Some day there will be an official awakening to the need of real precautions.—*Toronto Globe.*

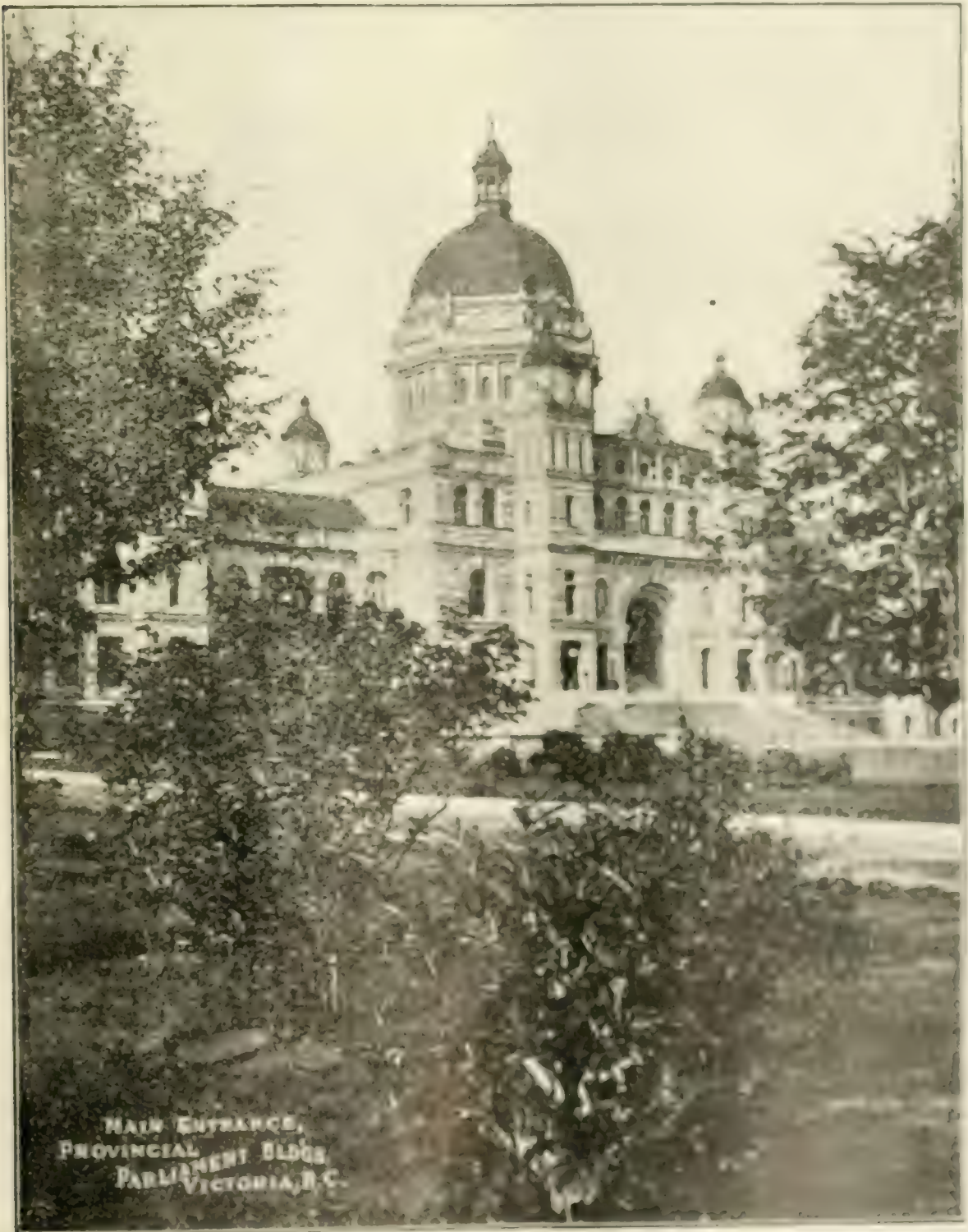
OTTAWA, CANADA.

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VOL. VIII.

JULY-AUGUST, 1912.

No. 4



MAIN ENTRANCE,
PROVINCIAL
PARLIAMENT BLDGS.
VICTORIA, B.C.

CONVENTION, VICTORIA, B.C., SEPT. 4, 5 AND 6.

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THE CANADIAN FORESTRY ASSOCIATION.

Extends a cordial invitation to those interested in the forests of this country, from whatever point of view, to join its ranks, and help to spread knowledge of, and interest in, the forests of Canada in particular, and in general of the world. During the past few years the interest in the proper use and the protection and perpetuation of the forests has greatly increased, and to this increased knowledge and interest the Canadian Forestry Association, by its propaganda work, has contributed its share. Founded in 1900, with a membership of 12, it has in twelve years increased its membership to 2,700. During these years it has held conventions throughout Canada from coast to coast, in the Ancient Capital and in the bustling cities of the prairies and Pacific coast, in the manufacturing east and the agricultural prairie country. Its official organ, *The Canadian Forestry Journal*, was started in 1905 and is now in its seventh volume. But as forestry goes on, circumstances change and new needs spring up, and the Association is anxious to do its duty in arousing public interest and pointing out ways of getting things done. One object of the Association was achieved when forest reserves were established; but that is merely a beginning and now proper administration of these reserves, on the basis of the public good, irrespective of any private or partizan interest, must be secured. When that is done other problems will present themselves for settlement. The Association wants the interest and enthusiasm and, in some degree, the contributions of the public. The annual membership fee is \$1.00; this entitles the member to *The Canadian Forestry Journal* for a year, the annual report of the society, and other literature. Life membership costs \$10.00. Applications for membership should be addressed to James Lawler, Secretary, Canadian Forestry Assn., Canadian Building, Ottawa.

R. O. SWEEZEY,

CIVIL & FORESTRY ENGINEER

Timber Surveys, Lumbering
and Water Powers.

Metropolitan Bldg. - - QUEBEC, Canada.

United States Postmaster-General Hitchcock has strengthened the forest fire preventive force of the United States by almost 55,000 men. These men are the rural and star route carriers of the postal service, who are directed to co-operate with the forest rangers and State fire wardens whenever and wherever possible. Forest fires last year destroyed approximately \$50,000,000 worth of property. The Department of Agriculture has been anxious to increase in every way the efficiency of its preventive service. Postmaster-General Hitchcock has found the way to offer assistance, and as soon as his plan was found feasible the order referred to was issued.

The county of Hastings will purchase some hundreds of acres of land in Elzevir township for the purpose of reforestation. This county is the first to undertake this work.

CANADIAN FORESTRY ASSOCIATION.

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The Victoria, B.C. Convention.

September 4, 5 and 6 the Dates Decided Upon

Wednesday, Thursday and Friday, Sept. 4, 5 and 6 are the dates set for the holding of the convention at Victoria, B.C. The proceedings will open with a reception on the evening of Sept. 4, and on the two following days morning and afternoon sessions, at 10 a.m. and 2.30 p.m. respectively, will be held in the commodious and centrally

located hall of the Alexandra Club. On Friday evening Sept. 6, it is expected that a banquet will be held at the Empress hotel.

The government and people of British Columbia have awakened to the value to them of their forests, and when the people of the Pacific province become roused prompt and vigorous action is the result. At



Looking Towards Victoria from the Parliament Buildings.

the last session of the provincial legislature there was passed a Forest Act, which is in many respects the most advanced piece of forestry legislation that has been enacted on this continent. So favorably is it regarded that the State of California is said to be about to pass legislation which is largely a reproduction of this Act.

Not only will Hon. W. R. Ross, Minister of Lands, who has jurisdiction over the province's forests and in whose department the new Forest Branch is placed, take an active part in the convention, but the premier of the province, Hon. Sir Richard McBride, K.C.M.G., is taking a personal interest in the convention and will deliver an address.

Forests and forestry in British Columbia will naturally take up the greatest share of attention at the meetings, but the papers and discussions will not be confined to these only.

Many of the leading foresters and lumbermen of the province and of the whole Dominion will be present at the convention, and sessions of the greatest interest may be looked for.

To Easterners who attend, not only will the convention be interest-

ing but the entire journey to the Pacific coast will be of the greatest interest and their visit to the province will afford them the greatest enjoyment. In Vancouver the Pacific province possesses one of the most substantial and rapidly growing cities of the North American continent. It has now a population of 140,000 (including suburbs) and is looking forward to great things in the future, especially after the Panama canal is completed. The city includes the famous Stanley Park, with its big trees, in which the tree lover will find special delight. Capilano Canyon is another point of interest that will divide general attention with the famous park.

From here, the capital city of Victoria, the scene of the convention, is some five hours' sail down the Strait of Georgia. Not only does it include many beautiful buildings (of which the Parliament buildings are the chief), but it is famed also for the beauty of its surroundings. The immense timber resources of Vancouver Island, and its possibilities in many other directions will also engross the attention of the visitor. The railway development of the mainland must be an additional source of wonder to the tourist.

Group and intensity as social factors
in political



Hon. Sir Richard McBride, K.C.M.G., Prime Minister of British Columbia.

The British Columbia Forest Act.

The province of British Columbia, in its 'Forest Act,' passed at the last session of the Legislature, has taken what many consider the most advanced ground yet taken on this continent in regard to the preservation and perpetuation of its forests.

The Forest Branch.

By this Act the Forest Branch of the Department of Lands was created and given most extensive powers in regard to the timber and timber-

lands of the province. These powers include the entire administration of the crown timberlands, control of all revenue arising therefrom, the conservation of the forests, including their protection from fire, reforestation, sales and disposal of timberlands, scaling and regulation of traffic in timber and logs and the enforcement of statutes relating to the regulation of the forests.

All officials and servants of the Forest Branch are to be subject to all

Civil Service rules and are forbidden to have any property interest in the forests of the province.

The Forest Board.

The head of the Forest Branch is the Chief Forester. The Forest Board, constituted by the Act, is to consist of the Chief Forester, *ex officio*, and five other foresters or other officials of the department. The Board holds office at the pleasure of the Lieutenant-Governor-in-Council.

The function of the Board is, in brief, to secure the enforcement of the provisions of the Act. They are given power to summon witnesses and demand the production of documents, and to compel the attendance of witnesses and punish for contempt, 'in the same way as any Judge of the Supreme Court in the like behalf.'

Sale of Timber.

The old method of staking a timber claim is entirely abandoned. In cases where the present reservation may in future be opened up, the land is first cruised as to the quantity of the timber and surveyed, after which licenses are offered for the same by tender.

In the case of pulp limits the licenses will be sold on rather favorable terms. The present pulp concessioners will remain the same until they are renewed. It is noticeable in this connection that the government for the purpose of uniformity retains the licensing system, although the conditions are much altered.

Timber leases as they at present exist will be recognized and continued in future, but as certain leases come up for renewal new terms will be imposed by the forestry department in view of the terms and conditions imposed on other holders of timber as to maintain them all on an equality as far as possible. In regard to timber licenses, it is provided that all surveys of special licenses shall be completed before the 15th of March

1908, the government retaining the power to compel and control surveys. If due diligence be not observed by the holder, the department may direct surveys to be made and charge expenses up to the holder. People's regulations are put in force for surveying land held under water licenses, as distinct from lands surveyed for agricultural purposes. Licenses granted on or before April 15, 1902, are made renewable for sixteen years, and licenses granted between April 15, 1905, and March 10, 1910, for twenty-one years. Licenses may be cancelled if there is not on the land sufficient merchantable timber to make it commercially valuable.

Scaling and Marking.

The present provisions of the land act in respect to timber scaling and measurement are not interfered with, but in districts where there are no official scalers provisions analogous to those in the Ontario Cutters' Act will be put in force, requiring stationing and licensing of unofficial scalers.

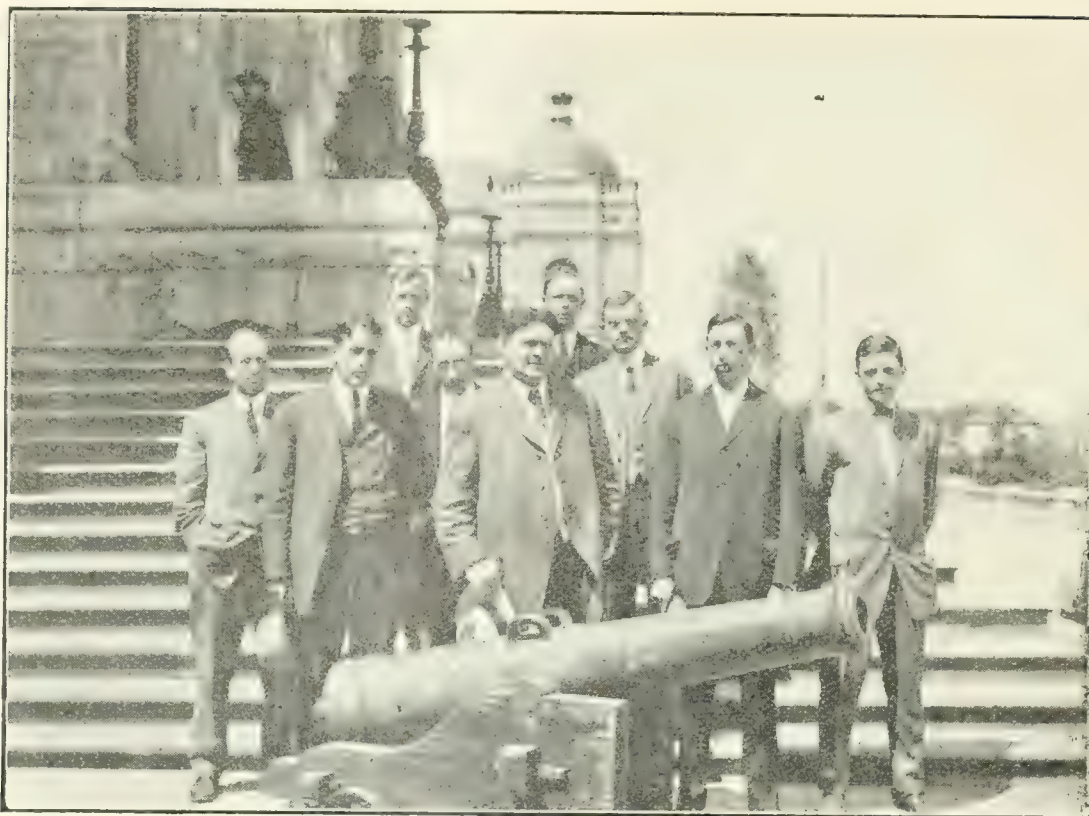
The present law in respect to timber marking and manufacture within the province of timber products will practically remain unchanged.

West of the Cascades the British Columbia log scale is to be used; east of this, whatever log scale may be decided on by the Lieutenant-Governor-in-Council.

Protection from Fire.

The most important features of the law relate to the prevention of fires, and these are entirely new. For practical purposes they may be divided into two parts. One relates to the deposition of debris, and the second to the precautions to be observed in the use of fires.

In the case of the first it is made compulsory to remove all dangerous accumulations. The department, while recognizing the responsibilities of the landowner,



Group of Forestry Officials Taken at Victoria, B.C., May, 1912.

This photograph is remarkable in its way, showing, as it does, representatives of several different forest services and graduates of the leading forest schools of America. It was taken outside the Parliament Buildings, Victoria, last May. Hon. W. R. Ross, Minister of Lands, who is in charge of the forests of British Columbia, is in the centre of the foreground. Reading from left to right the names of the men are as follows:—

R. E. Benedict, Chief of Operation, B. C. Forest Service; R. D. Prettie, Forestry Superintendent, C.P.R. Department of Natural Resources; D. R. Cameron, Inspector of B. C. Forest Reserves, Dominion Forest Service; Hon. W. R. Ross, Minister of Lands for B. C.; A. H. D. Ross, Lecturer, Faculty of Forestry, University of Toronto, and Consulting Forester C.P.R.; Clyde Leavitt, Forester for Commission of Conservation and Chief Fire Inspector for Railway Commission; John Lafon, Chief of Management, B. C. Forest Service; B. M. Winegar, Chief of C.P.R. Fire Protection Service.

sion, was careful to recognize the financial difficulties in the way of putting them completely into effect. The new regulations will conform largely to those which are in force in the western States. Special provisions are made for the clearing away of debris around camps and mines, mills, engines, on rights of way, telephone, telegraph, electric power and other lines. In respect to railways a safety zone is created on either side to the width of 200 feet, which must be kept clear of all combustible material. In every case the department retains the power of doing at the expense of the party responsible what the party fails to perform in accordance with the requirements of the act.

Logging operators may be required, in the case of dangerous slash, to make special provision for the prevention of fire when the minister requires it, by cutting out fire-lines.

The main feature of the provision in respect to fire prevention is the creation of a forest protection fund. Every owner of timber lands, whether in the nature of crown grants, leases or licenses, will be required to contribute a cent an acre to the expense of looking after fires and fitting out fire-crews. Crown-granted lands which do not pay royalty on the cut are required to pay two cents an acre. Against the amounts so contributed the government puts dollar for dollar. These contributions are not in the nature of taxation, but

go to create a fund which is expended for specific purposes enumerated, as for the expenses of patrol, telephone and telegraph appliances and the making of trails, according to the most up-to-date and improved methods of fighting fire. An automatic arrangement is put into effect for special assessments if the fund so created is not adequate for its requirements in any particular season. On the other hand, where the fund so created is more than sufficient for the requirements of any season, provision is made for a proportionate reduction in the contribution both from the timber holders and the government.

The framers of the act have gone pretty thoroughly into the methods of preventing the occurrence of fires arising from railway locomotives. Power is taken by the forestry bureau to compel patrol after the passing of each train. This is not new, as it exists in the Dominion act. Expenses of these patrols are to be borne by the railways, who must also maintain a force of fire wardens during construction of their line, and are also required to obtain certificates that the right of way has been cleared up before starting operations. A fine not exceeding one thousand dollars is imposed on the railway companies in case of fires which are started through negligence. Adequate provision is made for the use of preventive devices in the case of logging engines, locomotives, steamboats and portable engines. Proper precautions are also to be taken in the operation of open burners and incinerators.

Contributors to the regular fund for fire protection who have trouble with fires and who are placed at expense for extra protection and in fighting bush fires are recompensed by the government to the extent of one half of their expenditure. This in a measure has been the practice for some years past, but is now for the first time made a part of the law.

In regard to hand-lugger's licenses,

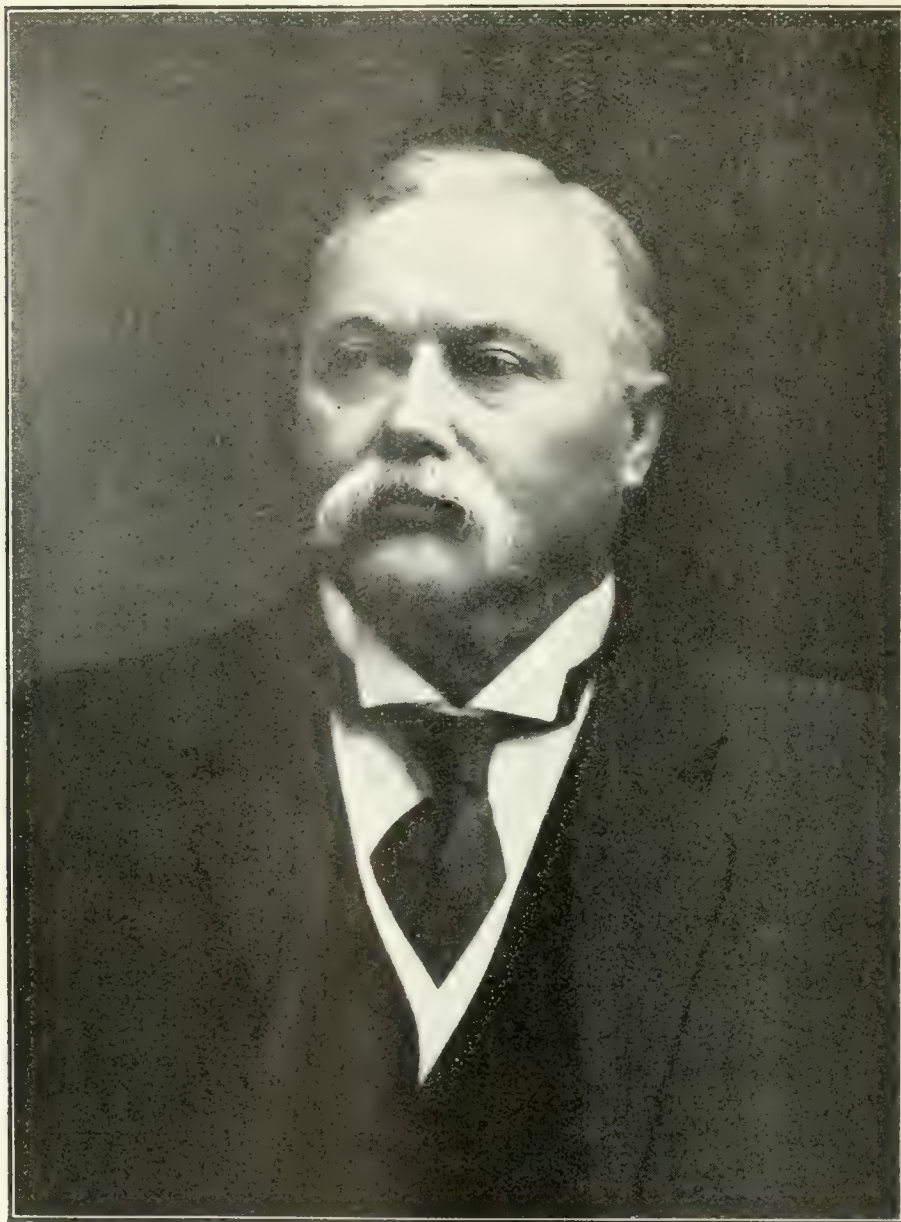
it is provided that the lieutenant-governor-in-council may from time to time authorize the minister to grant such licenses in districts in which injuries to the crown or other timber lands is not likely to result, subject to certain exceptions. Part seven of the act deals with royalties, taxes and charges, collections, accounts and returns. The provisions of this part cover all kinds of timber products. The scale of royalties has been substantially increased, and royalties imposed on lumber cut are imposed according to grade, the grades being divided into No. 1, 2 and 3, the charges being made on a graduating scale.

Under the act provisions are made for the creation of forest reserves on the basis and mainly for the purpose of reforestation.

BURNING OIL IN B. C.

During the first week in July a locomotive using oil as fuel started the regular passenger train on the run between Wellington and Allerton, the extension of the latest extension of the Canadian Pacific Railway, formerly known as the Esquimalt and Nanaimo railway. The experiment was very satisfactory, the run of forty miles with others being made on time, the new fuel working very satisfactorily. As a result the managers of the road say that, as fast as it can be done, all the locomotives on the entire line of the Island Division, amounting to 400 engines, will be equipped as oil-burners, even the one at each of the fuel steamships. The trains between Wellington and Allerton are now hauled only by oil-burning engines. That was in the danger zone, for it is largely oil that is together, removed, but the subject of passengers is greatly increased, owing to the elimination of smoke and noise.

After a run of a few days, and before they had made the journey, George Washington's father said that he would rather have his son go to the University of Toronto than to the University of the West Indies. He was talking of the school of medicine in the city of the West Indies. It is a very serious problem that in a few minutes' time, the people of the world are now facing, the question of the growth of rapidly growing and also of the land surface of the world.



John Hendry, Esq., President Canadian Forestry Association.

Experiment Needed in Pulp Making.

By H. R. MacMillan in Pulp and Paper Magazine.

When the various governments of Canada, federal and provincial, have been considering appropriations and plans for aiding and developing the productive industries which constitute the life of the country, one important industry has been overlooked. Agriculture, in all its branches, owes much of its progress to experi-

ments conducted by the different governments and to educational facilities provided by the governments; the fisheries of Canada are protected and propagated by the government; government exploration parties have located many of the most wealthy mining fields, and a Department of Mines is maintained to investigate

and improve the mining methods and metallurgical processes of Canada. The smelters and iron and steel mills of Canada have been rendered possible by large cash subsidies. The production of crude petroleum has been encouraged by a subsidy from the federal government. The one great industry which has received no direct government assistance is the manufacture of wood-pulp and paper.

The pulp industry does not need the kind of assistance given to the owners of smelters, oil wells and steel mills—a cash subsidy paid to encourage the investment of capital in plants which cannot, without artificial needs, both for the good of the country and the good of the pulp industry, is the type of assistance given to agriculture, that is, the establishment and maintenance of experimental laboratories where skilled chemists and pulp and paper experts will be encouraged to develop uses for woods, and wood waste now thought unsuitable for use in wood-pulp manufacture.

Public assistance extended to the pulp industry will profit the country one hundred fold, both directly and indirectly. The direct return will come from a closer and wider utilization of the forests of Canada which are owned by the different governments and which are large sources of revenue for the governments. There are three trees in Canada which occur in pulpwood forests that are not adapted for pulp under present methods of manufacture and which, because of their low value for any other purpose, are at present, to a large extent, wasted when pulp limits are logged over. These trees are jack pine, hemlock and tamarack. If any government experiments could devise a commercial means of converting these trees into pulp and paper, the added revenue accruing to the government from the use of these trees would pay the cost of these experiments. Similar trees in western Canada which await experimenting

are western larch, Douglas fir, western hemlock, and larch-pole pine. These trees are cut for lumber at present, and a great waste is made because the small logs, the tops and other portions cannot be used and are left in the woods and on them no royalty paid. If the government would demonstrate and encourage the use of these species the closer logging of the forest would mean a great increase in dues.

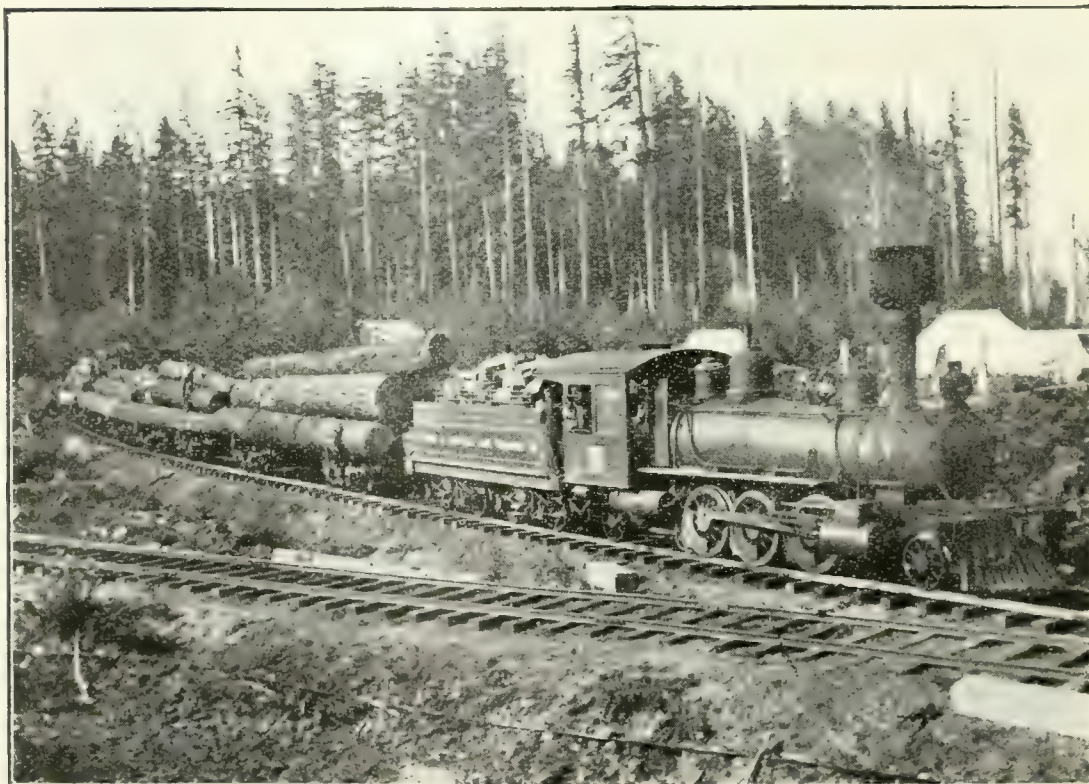
The profit which would come to the government and the communities from the establishment of more pulp-mills cannot be estimated. In 1910 there were produced in Canada about 470,200 tons of mechanical pulp and 74,400 tons of the chemical pulp. Investigations by the United States tariff board show that it costs in labor and other expenditures \$9.56 to produce a ton of mechanical pulp in Canada and \$16.47 to produce a ton of sulphite chemical pulp. There was a total expenditure of about \$425,000 for the manufacture of pulp in Canada in 1910. The average mill in Canada produces 7,200 tons of mechanical pulp and 200 tons of chemical pulp per year. In the one case it means an expenditure of \$69,360 per year, in the other case an annual expenditure of \$4,300. Government investigations in the manufacture of pulp would surely lead to the establishing of more mills. When each mill means \$70,800 per year in the country in which it is located, surely government assistance in the pulp industry is worth while.

Both in the United States and in India, where the conditions are not so favorable to the pulp industry as in Canada, the governments have established laboratories and employed experts for the study of more economical methods of making pulp, as to learn, if possible, new and cheaper filays.

At Wausau, Wisconsin, U.S.A., a ground wood pulp-mill was built by the federal government for the express purpose of carrying on experi-



Loading Logs, Vancouver Island.



Logging Train on Vancouver Island.

ments useful and of interest to pulp makers. This mill is not equipped with a paper machine.

The cost of installing the machinery in the mill was about \$40,000. The yearly cost of carrying on the experiments has been about \$20,000.

The mill is operated by a technical staff of three and a skilled staff of three, in addition to a stenographer.

At the head of the technical staff is a chemical engineer in charge of the work. The chemical engineer at Wausau is Mr. J. H. Rhickens, who studied paper making at the university of Wisconsin, and had practical experience in the paper industry and at electrical engineering before taking up this work. He supervises the laboratory work, prepares plans for carrying out the different tests and keeps the electrical equipment of the plant in running order. The chemical engineer also makes examinations of fibre.

There are two assistant chemical engineers. One looks after the electrical machinery and supervises the tests and conducts such analytical work as he can look after. He acts as manager when the manager is absent. The other is almost entirely occupied in carrying on analytical work and calculating the results. He also assists in conducting laboratory tests.

The skilled labor consists of a grinder man, wet machine man and press man. The grinder man operates the pulp grinder and keeps it, with its auxiliary equipment, in repair. The wet machine operator keeps in repair the screens and wet machine. The press man removes the paper from the rolls and assists the wet machine man. These men are also employed in the sawing, barking and preparation of the wood for grinding. All have had practical paper-mill experience.

The woods experimented with have been furnished by the American Paper and Pulp Association. The species used to date (jack pine, hemlock, tamarack and spruce) are from

the Lake States. The experiments carried on have had as their object the making of a newsprint paper from jack pine or hemlock or from mixtures of jack pine, hemlock and spruce, which would be satisfactory from the point of color, strength and finish, and which might replace the newsprint made from spruce.

The experiments have been under the supervision of a committee of papermakers, who have inspected the work every month. Satisfactory pulp has been made from hemlock and jack pine, and a short time ago a batch of the pulp was sent to a paper mill at Port Edwards, where test paper was made of the following seven combinations:

First, an all-hemlock sheet of news paper, containing 25 per cent. of hemlock sulphite and 75 per cent. of hemlock groundwood.

Second, a sheet containing 25 per cent of hemlock sulphite, 25 per cent of hemlock ground wood, 25 per cent of jack pine ground wood, and 25 per cent of spruce ground wood.

Third, a sheet containing 25 per cent of hemlock sulphite and 75 per cent of jack pine ground wood.

Fourth, a sheet containing 25 per cent of hemlock sulphite, 50 per cent of hemlock ground wood and 25 per cent of jack pine ground wood.

Fifth, a sheet containing 25 per cent sulphite, 25 per cent spruce ground wood and 50 per cent hemlock ground wood.

Sixth, a sheet containing 25 per cent hemlock sulphite and 75 per cent spruce ground wood.

Seventh, a sheet containing 5 per cent hemlock sulphite and 95 per cent spruce ground wood.

Each of the seven different papers was satisfactory, though some were better than others. From the result of these experiments it has been concluded that it is possible to make usable and saleable ground wood pulp from hemlock and jack pine, and that mixtures of this pulp with sulphite

spruce make satisfactory newsprint and wrapping papers.

The Wausau laboratory will now undertake the manufacture of ground wood pulp from lodgepole pine, western hemlock, western larch, western yellow pine and white and red fir. The use of these species for ground wood pulp will mean much to the provinces of British Columbia and Alberta.

Experiments in the manufacture of chemical pulp are carried on in the Forest Products Laboratory at Madison, Wisconsin. This is the largest and most complete laboratory of its kind in the world. The building, costing \$100,000, was erected by the University of Wisconsin. The equipment, staff and operating expenses are supplied by the United States Forest Service.

The laboratory started work in June of this year. The results of the

work have not yet been published, but it is known that a good quality of kraft paper has been manufactured from the saw-mill waste of western yellow pine, that the saw-mill waste of Wisconsin has been found satisfactory for chemical pulp manufacture, that great advances have been made in the manufacture of a good quality of chemical pulp from dead and green tamarack, hemlock and jack pine. The staff at Madison have also examined samples of pulp from practically all the mills in the country, and have worked out satisfactory methods of standardizing, comparing and grading wood-pulps.

Similar work has been taken up in India by the Imperial Forest Research Station which is maintained at Dehra Dun by the Indian Forest Service. An experienced paper and pulp man, W. Raitt, has been retained by the imperial government to investigate the suitability of different Indian



In the Tall Timber, Vancouver Island.

woods and grasses for the manufacture of pulp.

The development of the science and technique of pulp and paper making to such an extent that commercial plants will find it possible to support themselves upon the vast quantities of wood waste and of inferior species of woods now annually lost in this country will require continuous systematic investigation by experts. A certain amount of this work will be done by private individuals, by pulp-mill operators and by consulting engineers, but no private individual can afford the time and expense necessary to a thorough study of the whole question. On the other hand, the support of such experiment stations as those at Madison and Wausau, which cost \$25,000 and \$20,000 respectively per year to operate, would be an easy matter for a government, especially if the pulp and paper manufacturers of Canada followed the example of the American Pulp and Paper Manufacturers' Association and assisted to some extent. Certainly every pulp and paper manufacturer in Canada would benefit by any scientific work which would extend the sources of pulp fibre and improve the processes of manufacture.

A soundly planned, thoroughly executed investigation can best be carried out by the Dominion government. The first step would be to collect under one organization all the available information bearing on the subject, both in Canada and in foreign countries, to correlate this information and put it in such shape as to be always available. The branch of the government charged with this work would not only passively distribute information on application, but would also take steps actively to bring to the attention of all private individuals who could benefit by it any new developments in the manufacture of pulp and paper. This work should be carried on with the full co-operation of scientific men and of practical men

engaged in the pulp and paper industry everywhere in Canada.

There are several reasons why this work can best be handled by the government. The government can more readily secure confidential and important trade information than can a private individual. Work carried on by the government would be known to be disinterested and impartial. Valuable results secured by the government would quickly and freely be made available to all persons, and the good results would be more widespread than if the same information had been secured by private individuals. The best work can be done only by a central and permanent organization. Such an organization would be more likely to be developed by the government than by a private individual.

The logical branch of the government to undertake the work would be the Forestry Branch. The Forestry Branch has now a greater knowledge of forest conditions in this country than any other organization in Canada. It has during the past few years made special studies of the pulp industry and other wood-using industries, and is in touch with all the forest industries of Canada. The employees of the Forestry Branch have covered the country from the Atlantic river to the Pacific, and will probably, in the next few years, do much scientific work in Eastern Canada. Work conducted by the Forestry Branch would be conducted solely for the good of the country, for the good of the pulp and paper trade, and to demonstrate that the Dominion could increase its welfare almost as much by a better ordering of the consumption as by an increasing production of wealth, and thus without any retrenchment in consumption.

The State of Minnesota is conducting the Forest Survey, and at the last session we found that eight bills have passed dealing with different phases of the forestry problem.



Portage Inlet, one of the Beauty Spots near Victoria.

Le Budget des Forêts en Norvège.

Par H. Perrin dans la Revue des Eaux et Forêts.

Il m'a semblé intéressant de porter à la connaissance des lecteurs de la Revue les chiffres arrêtés par le Storting norvégien pour le budget des forêts de l'exercice courant; à un moment où l'on étudie tout spécialement chez nous la possibilité d'une intervention de l'Etat dans la gestion et l'amélioration des propriétés particulières boisées ou boisables, ainsi que les moyens de relever les soldes des fonctionnaires forestiers, cette publication indiquera comment on solutionne là-bas ces difficiles problèmes... en consacrant aux dépenses ainsi engagées la majeure partie des recettes.

Mais il faudra bien se garder de faire, entre les chiffres qui vont

suivre et ceux élaborés par notre parlement, un rapprochement tant soit peu poussé (qui serait d'ailleurs tout à notre désavantage), car les conditions d'établissement des budgets des deux pays ne sont pas comparables: c'est, en effet, d'une part, la propriété privée qui détient la presque totalité des forêts de rapport en Norvège; et, d'autre part, nos collègues scandinaves ont, de par leur hiérarchie, l'étendue de leurs circonscriptions, et les pouvoirs qu'ils y possèdent, des attributions qui ne concordent guère avec les nôtres.¹

¹Cf. Voyage en Norvège (Revue des Eaux et Forêts des 1er et 15 mai 1910).

I.—Budget de l'Economie forestière privée.

Il est naturellement tout en dépenses.

1° Ecoles primaires forestières de l'Etat, 33,348 fr. (86,669,60).

Au nombre de 3, et dirigées par des chefs de cantonnement, ces écoles donnent une instruction surtout pratique aux jeunes gens desireux d'embrasser la carrière forestière. Les cours commencent en mai et durent un an; pour les années 1910 et 1911 réunies, il y a eu 256 demandes d'entrée et seulement 96 admissions.

Il est logique de porter ces établissements dans la partie du budget relative aux bois particuliers, car ils fournissent surtout des forestiers privés et, si leur diplôme est nécessaire pour obtenir un emploi de l'Etat, il ne donne pas, par contre, un droit absolu à cet emploi.

2° Subvention à l'école forestière de la province de Hedemark, 8,379 fr. (\$1,675,80).

Reliquat du même article de l'exercice précédent, 5,344 fr. (\$1,068,80).

Total, 13,723 fr. (\$2,744,60).

La commune de Storevoldal a mis à la disposition de la province de Hedemark son domaine d'Evensstad, qui comprend 2,000 hectares bons, pour y installer une école forestière; l'enseignement technique n'étant jusqu'ici assuré dans le Hedemark (qui est pourtant la province la plus boisée de la Norvège), que par une section de l'école d'agriculture de Jonsberg, cette création a obtenu un plein succès.

Le directeur de l'école d'Evensstad est nommé par le ministre de l'Agriculture; l'effectif est de 20 élèves; la rétribution scolaire de 112 fr. (\$22,40); les études commencent en janvier et durent une année, avec un programme conforme à celui des écoles de l'Etat sur tous les points essentiels; on fera ultérieurement des cours gratuits de fabrication

3° Subvention à la Société forestière norvégienne 182,000 fr. (86,400,00).

La Société forestière norvégienne est une société centrale qui comprend environ 1,700 membres directs et se subdivise en 18 sections ou sociétés forestières provinciales, comptant 7,500 adhérents; douée de la personnalité civile, elle possède en propre plusieurs centaines de mille francs; c'est elle qui répartit, comme elle le juge à propos, les subventions de l'Etat (notamment une subvention obligatoire de 70 francs (\$14,00) par hectare pour reboisement de forêts de protection). L'emploi des fonds accordés est surveillé par les fonctionnaires forestiers provinciaux et contrôlé par des inspections du chef de bureau de la société, lequel amasse au budget.

4° Traitement du chef de bureau de la Société forestière norvégienne 3,040 fr. (\$728,00).

5° Subvention pour les traitements et les frais de voyage des fonctionnaires forestiers provinciaux 36,910 fr. (\$1,138,20).

Reliquat de l'exercice précédent 4,780 fr. (\$790,00).

Total 69,690 fr. (\$12,138,00).

Choisis et partiellement payés par les conseils des provinces, ces fonctionnaires sont en quelque sorte au service des sociétés forestières provinciales, pour diriger les travaux entrepris par celles-ci et guider communes et particuliers dans la gestion de leurs domaines boisés. Leur institution tend à se généraliser, car elle donne d'excellents résultats.

6° Application des règlements sur les forêts de protection 11,200 fr. (\$2,240,00).

Dans les provinces, de plus en plus nombreuses où des conditions sont défavorables pour faire une sylviculture normale d'exploitation, les gouvernements peuvent se faire rem-

bourser par l'Etat la moitié des dépenses occasionnées par l'application de ces règlements.

7° Indemnisation des dommages causés aux forêts par les castors 2,800 fr. (\$560.00).

Encore assez répandus en Norvège, et même en voie de multiplication dans certaines régions, ces animaux causent de graves dégâts aux peuplements feuillus, surtout à ceux de tremble; dans le but d'empêcher la disparition de l'espèce, leur chasse fait, jusqu'à nouvel ordre, l'objet d'une réglementation spéciale qui interdit la destruction des colonies.

Le total des dépenses, pour la première partie du budget, s'élève donc à 307,401 fr. (\$61,480.20) contre 267,414 fr. (\$53,482.80) pour le terme échu.

II. — Budget des forêts de l'Etat.

RECETTES.

1° Exploitation des forêts de l'Etat 1,372,000 fr. (\$274,400.00).

2° Exploitation des pépinières 50,400 fr. (\$10,080.00).

3° Quote-part des établissements publics dans les traitements des fonctionnaires forestiers 37,800 fr. (\$7,560.00).

Total 1,460,200 fr. (\$292,040.00).
soit une augmentation de 123,000 fr. (\$24,600.00) sur l'exercice précédent.

DEPENSES.

1° Achat de forêts (non compris le reliquat des crédits accordés antérieurement), 56,000 fr. (\$11,200.00).

2° Traitements des fonctionnaires forestiers du cadre supérieur, 153,102 fr. (\$30,620.40) contre 126,980 fr. (\$25,396.00) pour l'exercice 1911.

Nos collègues norvégiens ont vu, en effet, leur situation notablement améliorée cette année; depuis 1895, leurs traitements étaient les suivants:

Inspecteurs, de 4,200 à 5,040 fr.

(\$840 à \$1,008) après 10 ans de services.

Aménagistes, de 3,640 à 5,040 fr. (\$728 à \$1,008) après 16 ans de services.

Chefs de cantonnement: de 2,800 à 4,200 fr. (\$560 à \$840) après 16 ans de services.

Assistants de 2,100 à 2,660 fr. (\$420 à \$532) après 6 ans de services.

Planteurs 1,400 fr. (\$280).

Le directeur des forêts a réclamé l'augmentation de ces soldes en des termes énergiques:

"En présence de la cherté toujours croissante de la vie, la situation pécuniaire des fonctionnaires forestiers est devenue peu à peu si mécontente (utilfre distillende) qu'il serait inexcusable de la prolonger. Le rendement des forêts publiques est maintenant de 5 à 7 fois plus élevé que celui réalisé en 1895; le nombre de ces forêts a doublé depuis la même époque, et leur surface a augmenté de 237,000 hectares (585,650 ac.); les effectifs¹ et les traitements des fonctionnaires n'ont pas eu un accroissement parallèle."

Il est certain que l'extension des travaux de reboisement, de culture et d'amélioration occasionne aux agents un surcroît de besogne et de responsabilité, en ce qui concerne la tâche matérielle et la comptabilité; et la seule considération de l'importance des sommes et des intérêts d'ordres divers que gèrent ces agents devrait être un motif valable pour leur octroyer des émoluments en rapport avec leur responsabilité.

Actuellement, les meilleures forces sont souvent enlevées à l'Etat, à son grand détriment, par l'appât de situations plus avantageuses (par exemple deux ou trois fois mieux rémunérées) que celles qu'il peut offrir.

¹L'effectif des agents était, en 1909, de 4 inspecteurs, 25 chefs de cantonnement, 1 aménagiste, 4 assistants, 12 planteurs; je ne crois pas qu'il ait été modifié depuis lors.

Le ministère s'est associé au directeur des forêts pour reconnaître l'"insoutenable" situation due à l'insuffisance des traitements actuels et a déclaré "déplorable au point de vue de l'utilité publique et injuste vis-à-vis des fonctionnaires forestiers de faire attendre cent et plus longtemps"; mais les nécessités de l'équilibre du budget et la dépense qu'occasionnera pour l'Etat l'incorporation de ces fonctionnaires à la caisse des retraites l'ont obligé à soumettre au Storting une échelle de traitements un peu inférieure à celle réclamée par le directeur des forêts:

Inspecteurs: une seule classe à 3.000 fr. (\$1.120).

Aménagiste: de 3.640 fr. à 5.320 fr. (\$728 à \$1.964) par classes de 560 fr. (\$112) tous les trois ans.

Chefs de cantonnement: de 4.360 fr. à 5.940 fr. (\$672 à \$1.998) par classes de 560 fr. (\$112) tous les trois ans.

Assistants: de 2.100 fr. à 2.940 fr. (\$420 à \$588) par classes de 280 fr. (\$56) tous les trois ans.

Planteurs: de 1.680 fr. à 2.240 fr. (\$336 à \$448) par classes de 280 fr. (\$56) tous les quatre ans.

Les agents seront en outre désormais obligés de faire des versements à la caisse des pensions de l'Etat.

Ce projet a été approuvé à l'unanimité par le Storting dans sa séance du 22 mars 1912, mais le directeur des forêts insiste et demande l'insertion au prochain budget de ses propositions, qui étaient les suivantes:

Inspecteurs, 6,300 fr. (\$1,260)

Aménagiste et chefs de cantonnement, 3,920 à 5,940 fr. (\$784 à \$1,008)

Assistants, 2,800 à 3,360 fr. (\$560 à \$672)

Planteurs, 1,680 à 2,240 fr. (\$336 à \$504).

De la discussion du même chapitre, il résulte que deux des quatre inspec-

teurs seront désormais attachés à la direction; cette mesure sera étendue au troisième dans le courant de l'année, seule, l'inspection du Nordland (Extrême Nord), trop éloignée de Kristiania restera indépendante jusqu'à nouvel ordre. On considère ainsi une utilisation meilleure et plus économique du travail et des voyages du personnel de contrôle, par la possibilité d'établir chaque année au plan de répartition de la foresterie entre le directeur, le conseiller des forêts et les inspecteurs.⁽¹⁾

4° Frais de fournées: 44.800 fr. (\$8,960.00).

5° Traitement des fonctionnaires forestiers salariales et des gardes-chasse: 47.040 fr. (\$9,408.00)

6° Reboisements: 108.000 fr. (\$21,712.00).

7° Achat de terrains pour la création de forêts sur la côte ouest (reliquat des exercices précédents), Pr mémoire.

8° Loyers de plans et arbragements dans les forêts de l'Etat: 19,740 fr. (\$3,948.00).

9° Dépenses pour l'agilisation des forêts de l'Etat, 476,000 fr. (95,200).

Il s'agit là des travaux d'amélioration, création et entretien de chemins, achèvement d'un aboird de flottage à la cascade de Hæglabø, régularisation de cours d'eau à Spang, établissement d'un "logement de fonctionnaire" à Rendal (10,640 fr. \$2,128.00) et subvention de 2,800 fr. (\$700.00) à l'Union norvégienne des chasseurs et pêcheurs pour la destruction des animaux nuisibles.

10° Bureau de travaux: 2,000 fr. (\$420.00).

11° Dépenses diverses, diversifiées: 7,000 fr. (\$1,400).

Dans ces 7,000 fr. sont compris: 1,400 fr. (\$280.00) représentant le dernier tiers d'une subvention de 4,200 fr. (\$840.00) pour l'établisse-

ment d'une carte forestière de Norvège, et 1,400 fr. (\$280.00) pour préparer la participation de l'Administration des forêts à l'exposition de Kristiania en 1914.

Le total des dépenses se monte à 974,342 fr. (\$194,868.40), en excédent de 40,200 fr. (\$8,040) sur l'exercice précédent.

Comme conclusion des données ci-dessus, l'exposé du budget comporte un aperçu sur le produit net, en 1912, des massifs soumis au régime forestier, aperçu dont voici le résumé :

Recettes: 1,460,200 fr. (\$292,040.00).

Dépenses: 974,342 fr. (\$194,868.40)

Excédent: 485,858 fr. (\$97,171.60)

Mais il convient de retrancher du montant des dépenses certains débours étrangers, en réalité, à l'objet qui nous occupe: achat de forêts ou de terrains à reboiser, subventions à divers pour constructions de chemins, etc., en tout 100,240 fr. (\$20,048.00); le revenu réel est donc de 586,098 fr. (\$117,219.60).

Il faut encore ajouter à ce chiffre:

Le revenu net des forêts d'établissements publics, 695,940 fr. (\$139,188.00).

La valeur des bois délivrés aux usagers dans les forêts publiques, 280,000 fr. (\$56,000.00).

de sorte que le produit net des forêts gérées par l'Administration est approximativement de 1,562,000 fr. (\$312,400.00) soit, pour environ 860,000 hectares (2,125,146 ac.), 1 fr. 85 par hectare (à peu près \$0.15 par acre).

D'après le "Tidskrift for Skogbrug".

Vesoul, 17 avril 1912.

The government of Western Australia is taking up the question of reforesting the cut-over areas in the southwestern part of that state. Their valuable hardwoods have been so deeply cut into that it is realized radical steps must be taken if the forests are not to disappear.

SOME 1912 FOREST FIRES.

The present season has not, up to the present, at any rate, been characterized by many or severe forest fires.

Though a number of forest fires were reported from southern British Columbia in May, e.g., around Yale, little damage was done, the fires being extinguished by rain.

The fires in the Bulkley valley, in northern British Columbia, reported during the first week of June, were mostly ground fires. The losses consisted mostly in buildings belonging to settlers. At Coquitlam lake, despatches of June 8 reported, the fires were not in themselves serious, though a large force of men was occupied in extinguishing them.

The forest fires in the Yukon Territory (referred to in the last issue of the JOURNAL) were finally extinguished by heavy rains, though not until hundreds of square miles had been burned over and thousands of cords of wood piled along the river had been destroyed. The Yukon District Council has since passed an ordinance increasing the penalty for starting forest fires.

The forest fires in Newfoundland towards the end of May wiped out five villages on the north coast of the island, burned several small lumber mills and destroyed some 100,000 logs; they were extinguished by rain. The loss is put at \$250,000.

Golden, B.C., had a bad fright during the second week of June, being twice threatened by forest fires. The first time, on June 8, it was saved by a favorable wind, but the fire destroyed two camps and a large quantity of saw logs; it was fought by 225 men. Again on June 10 it was in danger. A heavy rain soon afterwards came on and put out the fires.

Superior Junction, Ontario, on the line of the Grand Trunk Pacific railway, reported serious fires on June

5 and 26. The fire had assumed serious proportions on the previous Monday (June 24). Several bridges were destroyed and thousands of trees burned, the amount of damage being placed at \$100,000.

Sault Ste. Marie, Ont., on July 1st, reported fires in the vicinity of Shell Lake. Half a million feet of high grade white pine had then been destroyed, and four hundred men were fighting the fire. South Porcupine also reported that some of the Porcupine mines were in danger. The fire had found food in some of the dead brush left by the fire of July, 1911.

Halifax, N. S., reported on July 3, that forest fires were raging in some woodlands near the city. One of these was in the Sir Sandford Fleming park, near the Memorial tower, while on the Dartmouth side of the harbor a hundred volunteers were employed in beating out a fire.

The Chief Forester of B.C.

Mr. H. R. MacMillan, the recently appointed Chief Forester of the British Columbia Department of Lands, left Ottawa early in July and has now taken up the duties of his new position at Victoria, B.C.

The province of British Columbia is to be congratulated on having secured the services of so capable and energetic a forester as Mr. MacMillan. His connection with the Forestry Branch of the Department of the Interior dates back some years. In the first forest survey undertaken by the Branch, namely that of the Turtle Mountain forest reserve in the summer of 1905, Mr. MacMillan was chief of the party. He was then a student at the Ontario Agricultural College, from which he graduated in 1906, after a brilliant course, obtaining the degree of B. S. A. from the University of Toronto.



H. R. MacMillan, M.F., Chief Forester, Dept. of Lands, British Columbia.

In the fall of that year he entered the Yale University Forest School, graduating at the head of his class in 1908, with the degree of Master of Forestry. His vacations, in the meantime, had been spent in active forestry work, mostly with the Forestry Branch, and he then became a regular member of the staff. Since then he has been given a number of important and difficult assignments, both in field-work and in office-work, which have been completed with distinction. He entered with enthusiasm on the work of collecting statistics of the wood products of the Dominion and the work has become one of the most important parts of the Forestry Branch's work. The bulletin summarizing the results of these investigations have also been compiled under his direction. He has also been the author of several other bulletins of the Branch, and has been prolific in magazine and newspaper articles on various forestry subjects.

Mr. MacMillan's exceptional ability has been well tested, and he can be expected to demonstrate a good service for the Pacific province.

APPOINTMENTS BY MERIT.

The *Nor'-West Farmer* recently had a vigorous comment on the Canadian Forestry Association's resolution in regard to making all appointments to the dominion and provincial forest services only after examination. The editorial is as follows:—

One very hopeful sign of the times is the increasing strength of public sentiment in favor of removing our civil service entirely beyond the reach of political parties and placing it under non-partizan control. By frequent resolutions our western farmers' conventions have asked for this change, and now we find a similar request coming from another influential body, which, happily, has the advantage of closer contact with the legislators at Ottawa, and which undoubtedly enjoys the confidence of the leaders of both sides of the House. We refer to the Canadian Forestry Association, which, at its recent Ottawa convention, passed the following resolution:

'Whereas efficiency in the administration of the forests of Canada, which are one of the greatest of the national assets, can be obtained only by adopting a permanent policy carried out by a staff appointed on the grounds of special fitness for the positions which they are to fill, and removable only on ground of inefficiency;

'Therefore, resolved that this association urges on the federal and provincial governments the necessity for providing a system of examinations to test the qualifications of appointees and of making appointments permanent during good behaviour, and that in the case of the federal government for this purpose appointments should be placed in the hands of the Civil Service Commission.'

There is a special reason why partisan considerations should have no place in the forestry service. The work of the trained forester, in whatever branch, is of a highly specializ-

ed nature. Take, for example, the task of the field inspectors, who visit our prairie farms and advise farmers as to the planting of wind-breaks, and the proper layout of the farm grounds. This is a kind of work for which only few men are fitted, and in which a man devoid of an intimate knowledge of trees could soon do an inestimable amount of harm. And when one considers any of the other branches of the forestry work one soon discovers that it, also, demands the trained man. Indeed, one of the greatest difficulties so far encountered by those in charge of forestry work in Canada has been that of securing enough men of the right class.

What damage could be wrought by rampant, ruthless partisanship in such a department of the public service, if at any time it should, by some evil chance, happen to fall into the hands of a leader whose love for the party wholly upset his common sense! The damage would be incalculable. In this service, calling for special knowledge on the part of the workers, it is plain to see that continuity of service, irrespective of party supremacies, is of paramount importance.

And it is so in most of the other branches of public service. The agricultural department, the inland revenue department, the post office department, the railway department—in fact, all of them—demand that the workers shall be fit for the job, rather than that they wear a certain stripe of political coat.

The day when entrance to, promotion in and expulsions from our civil service shall be a matter of fitness, rather than a question of political favor, cannot come any too soon.

The University of Missouri has decided to establish a summer camp for lumbermen and woodsmen in connection with the summer sessions of the department of forestry of the institution. Prof. J. A. Ferguson, the director of the department, will be in charge.

Government Forests in Saxony.

By W. G. Wright, Wardner, B. C.

The Kingdom of Saxony is one of the most progressive states in the German Empire, and not least so as regards its forest policy. Scientific silvicultural methods have here developed to a maximum. Pinestock for timber run high, owing in part to the proximity of the consumer to the supply, and in part to the advanced social and political development of the state; and, in forestry as in agriculture, high prices bring in their train more intensive methods. This finds expression in more liberal expenditure on roads, reforestation and other improvements, more thorough and more systematic utilisation of products and in a short rotation.

Approximately half of Saxony's timber land belongs to the Government—about 433,000 acres or thirteen per cent of the total area of Saxony. The rest is divided among private estates, municipal forests and the like. The methods of management followed in the case of private ownership depend largely on the extent of the estate and the wealth of the proprietor. Municipal forests, when of sufficient size, are as a rule well managed and yield a good revenue. In 1909 state forests yielded \$0.08, private forests \$2.97, and municipal forests \$3.92 per acre. Wooded lands belonging to the villages (relics of old feudal days) are, on account of their limited area and the impossibility of working them under other than a selection system, a source of small, if any, profit to their proprietors. Their chief use is to provide fire-wood. In other parts of Germany it has frequently been found practicable to combine the management of several of these village holdings under one state-appointed forester, and this system usually works with success. It is, however, the object of this article to give some idea of the forest policy of the Saxon Government as regards its own forests, and to give some insight into the methods employed.

Character of the Woods.

Of the State Forests 97 per cent are composed of coniferous trees. Spruce (*Picea excelsa*) is the predominating species, forming 78 per cent, while Scots Pine (*Pinus sylvestris*) forms only 20 per cent of the woods. This is due in great part to geo-

graphical position. In the south-west corner of the German Empire the rainfall is low and usually not more than 20 inches. Pine is found taking the chief place with 60 per cent. As one proceeds further west the rainfall increases and we find the proportion of pine diminishing, until in Westphalia and Thuringia this tree comes near about 10 per cent. The greater part of Saxony has a rainfall somewhat above the average of that for Europe. And in the hills of the southern boundary 50 inches is often recorded. These conditions are very suited to the growth of the spruce, and in the hills, with the exception of a few beech woods, it holds undisputed sway. Silver fir (*Abies pectinata*) is grown only to a very limited extent here in Saxony, this species having been much in fact exterminated by factory fumes. Larch (*Larix laricina*) is met with very rarely, and then in mixture, the climate not being suited to its growth. Japanese Larch (*Larix japonica*) has been introduced, though with little success. Many North American varieties have been introduced, though mostly for ornamental purposes. Of the timber-producing trees Weymouth or white pine (*Pinus strobus*) and Douglas fir (*Pseudotsuga mucronata*) are the chief. White pine has met with some success, chiefly as paper or auxiliary species, its rapid growth making it particularly suitable for this, while Douglas fir has been sown with spruce with very good results, the only difficulty being its liability to suffer from frost. Jack pine (*Pinus banksiana*) and white pine (*Pinus strobus*) have been used as improvement species on very poor land, but though they have not been good for timber, Jack pine is preferred for this purpose, as it grows more later.

Of the broad-leaved trees, beech (*Fagus sylvatica*) is the most important, while oak, chiefly the pedunculata variety (*Quercus pedunculata*), birch, maple and other hard wood trees, play a minor or no part in the forest. Some American hardwoods, as the red, white and yellow oaks (*Quercus rubra*, *Q. alba*, *Q. prinus*) have been introduced, and have met with small success.

A large proportion of the state forests consist of pure woods, though in some of doubtful quality, pine and spruce are frequently planted together. The beech is in great spruce plant on mountain pine especially suited to it, as it was given a high rating at an early age. Black-bellied spruce forest, of which a comparatively large pro-

*The "price" here understood is the price paid by the manufacturer to the grower for the timber delivered on the selling area.

portion is used for pulping, can be grown in from 70 to 80 years, while pine requires 120 years to reach a marketable size. Later the formation of mixed plantations has been gaining favour. The hardwoods are mixed to a certain extent, but pure beech predominates.

As regards system of management, the state woods are worked almost exclusively under a system of high forest with clear cutting. There are some coppice woods and a few woods worked on the selection system, but they are not large enough to warrant their being considered separately. Among smaller non-state-owned woods, on the other hand, the coppice and selection systems are much more in evidence.

Of the wood felled in Saxony 97 per cent is coniferous, and of this 84 per cent. is merchantable timber. This finds a market as building material, mining props and pulpwood. The pulping industry originated in Saxony, and has considerable influence on the system of management of the woods. Material for pulping is almost exclusively supplied by spruce, though in Prussia, where spruce is scarcer, pine is sometimes used for this purpose.

Of the hardwood felled only about half is manufactured, the rest finding a ready market as fire-wood. The chair and toy factories absorb the greater part of the beech lumber, the last-named industry being of considerable importance.

Tending of the Woods.

Fellings are not commenced on a cutting area until the safety of the adjoining plantation from the attacks of natural and animal agencies is assured, so that a period of from seven to ten years usually intervenes between fellings on two adjacent areas. After cutting over, the area is, as a rule, left for one or two years on account of the danger from the large brown pine weevil, and then planted. After-culture is usually necessary for from five to ten years, according to the locality and the head of deer maintained on the range. At an age of about fifteen years, the plantation begins to close in, and at this period 'weeds,' such as birch, may be taken out. From the age of twenty years, self-pruning sets in and thinning is beneficial. According to the theory of 'the highest interest on the forest capital,' the heavier the thinning, within certain limits, the more remunerative is the forest. Accordingly, thinning is very important, for this reason, as well as for the reason that thinning improves the growth of the remaining trees. This is regulated by the Organisation of Woods Bureau in Dresden every ten years, and a special part is set aside for this item in the working plan. The chief principles of thinning as practised in Saxony are embodied in the three words 'early, frequent and moderate.' From the thicket

period on dead trees are taken out every year. This diminishes the risk of fire and insect calamities and yields enough to cover the cost of removal.

Formation and Organization of the Working Section.

The range is divided into compartments by rides and main rides, the latter being from eight to ten yards wide, and as a rule parallel to the direction of the prevailing winds (in Europe west and southwest), while the former are between two and three yards wide and at right angles to the main rides. These rides form the frame of the working section, facilitate any surveying to be done and serve as logging roads. By making them broad enough, the trees on their edges develop bushy stems and strong roots, thus acting as a series of wind-belts.

The compartments vary in size from thirty-five to seventy acres, and the tendency is to arrange them so that the length is about double the width, and so that the long side faces the wind. Customary dimensions are 600 and 300 yards, though these depend largely on the road network, and, in hilly country, entirely on the surface formation of the range. The compartment is a permanent forest division, but is split up into a number of non-permanent subcompartments.

The subcompartment is the unit of the working section, without which the proper carrying out of the working plan would be impossible. Each of the subdivisions differs from its neighbours in some important respect, and may change or lose its individuality as one rotation succeeds another. The ranges in Saxony are of sufficient uniformity in themselves and small enough to allow of all the woods on any range being included in one working plan, so that the working section is identical with the range. The working section is divided up into a number of felling series, the tendency being to make these short, of at most two compartments. Cutting is started on the east end, with intervals of from seven to ten years, continued toward the west. Temporary felling series are started as occasion demands, as, for instance, when a severance cutting is made, but these are absorbed into permanent felling series sooner or later.

The short felling series was first introduced in Saxony, its great advantage being that it gives great elasticity to the system of management. The idea is to build as many felling series as possible, and, by means of broad rides, make each one quite independent. Under this system there is a large choice in selecting the cutting areas for any period, whereas in the case of long, and therefore few, felling series, the choice is more limited, and the disorganisation and loss is much more serious in the event of any extraordinary felling, such as an insect

attack may render necessary. The size and form of each individual cutting area varies considerably, but a long narrow strip, running across the direction in which cuttings are being made, is the ideal.

Management of the Working Section.

The difference between timbering and forestry is that in the former the timber is treated as so much material to be converted into currency as quickly and cheaply as possible, while in the latter the timber is treated as capital, from which an annual income must be obtained. This principle of sustained yield forms the basis of all silvicultural management.

The normal yield is found by dividing the total area by the number of years in the rotation. This is fixed so that the interest on the capital sunk in the timber and in the land on which the timber stands reaches a maximum. This rate of interest is called the indicating per cent, and is, for all practical purposes, equal to the sum of the volume increment and value increment percents. Examinations are made of the indicating percents of the different woods, and the rotation is fixed on the results obtained.

To determine the actual yield for any period, the different woods are appraised to age-classes. In case the area of the woods in the older age-classes is above the normal, the yield for the period is increased above the normal to a corresponding extent, and in the opposite case, of course, it is decreased. Under the old compartment system, or rather by area and volume, the yield was estimated for several periods of twenty years. This was found impracticable, owing to more or less frequent changes in the area and character of the woods, and it is now the custom to determine the yield for a period of ten years only, and to have a revision in the middle of that period, so that any change in the woods, owing to fire, insect attack, gales, etc., and the like, may be taken account of and the felling plan altered accordingly.

The actual yield was determined there remains only the selection of the woods whence this yield is to be taken. In making this selection the woods agreed in the felling plan must also those which require to be cut over in order to facilitate the proper management of the rest, as for instance, successive fellings. Next in order of importance are those woods, the indicating percents of which have fallen below the rate of interest designated as equal invested in forestry, and which are therefore working at a loss. When these two classes have been disposed of, the balance of the yield is made up of the woods whose indicating percents have just reached an approximate to, a maximum.

The working plan for each year is put

together by the Government of Woods Bureau in Bangkok. The year before the close of each period, a party of foresters and surveyors visit this Bureau, come to the range and interview the wong. Further work done, more details of timber in each wood. For woods over forty years old the amount of timber is estimated and, for those under forty years of age, volume-increment tables are used. These tables are of great good value and importance, and are the result of many years' labor and experiment.

From the data so obtained the working plan is evolved. This consists of a general and a particular part, the former being necessary for the proper preparation of the latter. The first part contains a general description of the range concerned, as to where a limited location of each compartment and sub-compartment, with such details as quality of timber, arrangement in tabular form, a collection of statistics of yield, standing volume, growth, etc., of previous years, and general and special rules for future management. The second part, the *thawee*, then contains the felling plan, the most exact, includes felling, removal, sequencing, the afforestation plan and the road construction plan. The order and time of working and this work is left entirely to the discretion of the range officer and he draws up annual felling, planting and road construction plans as he thinks fit. One side of the page is used in entering an instruction in the particular part, the other side being reserved for filling in the work in which these instructions are carried out. By this means very accurate statistics are obtained, which are of great value in drawing up future working plans.

Disposal of the Fellings

The timber and pyroxy substances in Siam are mostly in the hands of small manufacturers, and this is no doubt due in large measure to the prevailing system of sale. The Government manages and logs all the state forests, and sells the material in small lots by public auction at a set rate on the felling area. This system is obviously very favorable to the small manufacturer in the country. The supply of sawing timber is sometimes restricted in some parts of Siam, but only to a few kinds of woods and under very narrow restrictions.

Cutting is carried out in the winter months, except in the case of special circumstances, when the best time is said to be spring. All work is done by hand methods. The larger logs are cut about three feet, the smallest and most common are about 12 to 15 feet in length, as material is difficult to be pulled out. The cost of felling and skidding averages \$1.50 per thousand feet, logged woods. Each log is used in accordance with the local custom, the felling being carried out in a regular system.

of which are supplied all prospective buyers. The auctions take place in some neighbouring town, each range distributing its annual yield of from three to four million board feet among five or six sales. The district revenue officer fulfills the duties of auctioneer, and either the conservator himself or one of his assistants is present to assist and determine upset price when necessary.

The purchaser of a lot of timber receives a check, authorising him to remove his purchase, payment being made direct to the district revenue office.

Owing to the proximity of the consumer, prices in Saxony are high, averaging \$7.78 per thousand feet, board measure, for total fellings and \$10.25 for merchantable timber. This is, of course, free of all cost of removal. Firewood brings only \$2.86 per cord. These prices are for the year 1909. With the cost of production absorbing 36 per cent of the gross income, the net profit per acre was for the same year \$6.06, bringing a revenue of over \$2,500,000 into the Saxon treasury.

Regeneration of the Woods.

For successful natural regeneration, frequent and good mast years are *sine qua non*. Owing to the short summer in the hills and to the effects of factory fumes generally, this requirement is seldom, if ever, fulfilled for the conifers. In the case of beech woods, however, natural regeneration is practised with success, though a good deal of after-culture is necessary. But, as the state forests are, for the most part, coniferous, clear cutting combined with artificial regeneration is general in Saxony, both sowing and planting being practised. Formerly pine woods were almost always regenerated from sowings, though now the planting of yearlings is gaining favor. For spruce, planting is better suited and this method is generally followed.

Sowing. — The usual method is to cultivate in the autumn, hacking strips about one ft. broad and from three to four ft. apart (these figures depending on species, locality and growth of weeds) and sow these prepared strips in the spring. For pine about four pounds of seed is required per acre, and for spruce about twice that quantity. Pine seed costs about 50c per pound, while spruce seed is much cheaper, costing from 20c to 40c. The total cost depends on the nature of the ground, quantity of weeds, distances, etc., and varies between \$3.50 and \$5 per acre.

Planting. — The method of cultivation used for sowings may be followed here, though it is more customary to hack patches or holes. The ground may with advantage be prepared for planting in the autumn, though it is not so necessary as it is for successful sowing. The plants are

put into the ground as late as possible in the spring so as to obviate the risk of spring frosts. As regards spruce, two to three year old seedlings are commonly used, and three-to-four-year-old transplants in unfavorable localities. In the case of pine, which develops a much larger and more vigorous root system, one- or two-year-old seedlings are the rule. Under favorable conditions it is customary to plant yearlings. These are preferable to two-year-olds, for the reason that they are very much cheaper to plant and do not suffer so much during the process. For exceptionally unfavorable localities, use is made of two-to-four-year-old transplants. The number of plants varies from 2,500 to 4,000 per acre, according to local conditions and the size of the plants. The cost of planting differs so much under different conditions, that it is impossible to give any representative figures. The cost of preparing the ground and planting may, under normal circumstances, lie between \$10 and \$15 per acre, but may rise, under abnormal circumstances, as high as \$20 to \$30. This is exclusive of the cost of the plants themselves, which are, as a rule, raised on the range. It is usual to have one or two permanent nurseries placed at points easy of access, and several temporary nurseries distributed about the range. It is recommended in the general rules contained in the working plan to lay out a temporary nursery on or in the immediate neighbourhood of each felling area whenever possible. In this way all ordinary needs of the range in this direction are satisfied. Any surplus is sold and, in the event of the stock not being sufficient, plants or seedlings are bought in as required from private or government nurseries in the vicinity.

The following prices per one hundred are averages taken from the 1911 annual price-list of nursery stock for sale on the different government ranges, published by the Minister of Finance:—

Spruce: yearlings for transplanting, 4 to 5c; two-year-old seedlings, 7c; three-year-old seedlings, 8 to 9c; four-year-old seedlings, 9c; three-year-old transplants, 12 to 20c, and four-year-old transplants 15 to 25c.

Pine: yearlings, 5c; two-year-old seedlings, 7c; two-year-old transplants, 9 to 19c, and three-to-four-year-old transplants, 15c.

Dr. Fernow's forest survey of the Trent water-shed has been going on satisfactorily during the summer, and it is expected that it will be concluded about Sept. 15. Letters received from members of the party indicate that they had a good deal of difficulty with wet weather during the earlier part of the season. Up to midsummer they had seen very little timber except maple, the greater part of the country having been burnt over.

The Aspen Tree in the Northwest.

By A. Knechtel, Inspector of Forest Reserves.

In the eastern provinces of Canada the aspen is considered a tree of little importance. Perhaps the only feature which commends it to the ordinary observer are the trembling leaves. Young trees in the woods have a beautiful orange-green color, especially in the spring, and the older trees a clean white. But few people go to the woods, and poplar trees grown in the city are usually a dirty gray.

The top of the aspen is not graceful. The branches are stiff, and, being brittle, are easily broken off by the wind, or by a heavy deposit of snow. In the spring the catkins litter the ground, and the down falls and sticks to the clothing of persons passing near the trees. The roots have the disagreeable habit of throwing up suckers, and so the tree is not a desirable one to have in close proximity to the lawn or garden. As an ornamental tree, therefore, it is not much in favor.

In the East the tree grows most in mixture with other trees and seldom reaches a large size. On account of the brittleness of its branches, which, when broken off, leave wounds where spores of fungi find easy lodgment, it decays at an early age. In the West, however, it forms large forests. The Riding Mountain Reserve, which covers an area of 1,535 square miles, consists mostly of poplar, and the Moose Mountain Reserve of 101 square miles is covered with this species almost exclusively.

The trees in these woods grow to large size for the species, some reaching thirty inches in diameter and many fifteen inches at breast height. Here, as in the East, the poplar is subject to attack by fungi, but on account of the dryness of climate in the West the growth of the fungi is

not so vigorous and large areas can be found covered with sound timber, the trees with trunks tall, straight and clean. As one looks at such woods from the sunny side the upper portions of the trees, on account of the clean gray color of the bark, appear as if they had been white-washed.

In the East poplar is used chiefly as pulpwood, and in Canada very little is taken even for this purpose. But in the West it is much used as fuel, and many log homes are built of it. Recently considerable quantities have been turned into lumber. It makes excellent flooring, is durable when kept dry, and has for several years been much used in the construction of rough buildings, such as granaries and stables. It dresses very well, especially when frozen.

In the prairie provinces poplar is likely to be the great building wood of the future. It is the only abundant wood in that region that reproduces easily from the root. White birch also sprouts from the root, but its quantity is small, compared with poplar. The sawtooe will supply the market for only a short time hence. Jack pine and lodgepole pine reproduce readily from seed, but they grow very slowly. Poplar grows rapidly. I have seen many areas covered with a fine stand of trees which had grown to the height of a man in one year after a fire.

A poplar forest can be managed by an easy silvicultural method. It is necessary only to take out the logs suitable for lumber, to cut into small wood the timber remaining, and then to burn the tract clear. From the ashes will rise a young forest which will produce timber that will rapidly become suitable for all the necessary purposes of an agricultural community.

STUDYING CANADA'S FORESTS.

Prof. Gunnar Andersson, of the University College of Commerce, Stockholm, and Jagnastare A. Holmgren, of Ostersund, Sweden, are at present on a visit to Canada, making a special study of the forests and wood industries of this country. They recently spent a couple of days in Ottawa, looking up information particularly in regard to the forests under Dominion administration, and visiting the wood industries of the Capital and vicinity. On leaving they expected to pay a visit to the party engaged in reconnaissance work in Central Ontario, and after visiting the Pacific Coast, will return home about the end of August.

EXPORT OF CHRISTMAS TREES.

Mr. S. S. Bain, nurseryman, Montreal, recently had a very interesting letter in the *Montreal Witness* on the question of the export of Christmas trees from the eastern townships of Quebec. He states that just before Christmas each year a number of men come over from the United States and buy up thousands of spruce trees from six to fifteen feet high, to be used as Christmas trees. For these they give three fourths of a cent to one and a half cents in the woods, and the farmer usually gets the job of hauling them to the railway. Mr. Bain contends that this shows great ignorance on the part of those who sell trees from their land for such a trifle. The larger of these trees, he says, if fit for fence posts, are worth from eight to ten cents each; and with the growing scarcity of timber they would soon be worth much more. As showing what might be done he refers to his experiences on a forest plantation in Britain. There, land unsuited for agriculture was planted with trees from three to four feet apart each way. When large enough for fence posts the first thinning took place, the trees to be cut not being taken out haphazard by any Tom, Dick or Harry, but marked by a forester. The next thinning took place when the largest part of the tree would make a light railway tie. The next section was sold for pit props and the remainder was large enough for a fence post. These two thinnings repaid the cost of the original investment, and the rest of the crop was left to mature to be cut into

timber. Some people argue that this cannot be done in Canada where the land belongs to a farmer, but Mr. Bain contends that the Dominion Government, exercising its power of eminent domain, could designate what areas were unfit for any other crop than trees and compel the owner to always keep such lands under a tree crop. If the farmer when felling Christmas trees would have them cut on the plan of thinning out so that the remaining trees would have a better chance to develop there would be no objection; but as it is the buyer goes in and slaughters everything without regard to the future crop. He holds that something must be soon done because of the excessive cutting now going on. From the County of Brome last December there were shipped sixty seven carloads containing from 1,200 to 1,500 Christmas trees each, and these were not culls, but the most perfect symmetrical trees, leaving nothing but crooked and deformed trees on the land. Mr. Bain is very anxious that government action should be taken to stop this loss and show the farmers what an immense revenue they are losing by denuding the hilltops and hill-sides of the eastern townships of the magnificent forests that once crowned them. At the Canadian Forestry Convention in Ottawa in February, 1912, this subject of the export of Christmas trees from the eastern townships was brought up by several delegates and presented by them to the resolutions committee. A general resolution was passed on the subject as follows:—

Resolved, that this Association deprecates the practice of exporting in large quantities Christmas trees of spruce and balsam and recommends legislation to prevent such practice.

A more sweeping resolution was not passed, because as Mr. Bain pointed out, there would be no great objection to the practice if the farmers got a sufficient price for their trees, and also if the trees were taken on a systematic thinning plan which would allow the development into useful timber of those left behind.

Journals Wanted.

In order to complete his file, a member of the Association requires the second and third issues of Volume 4 (June and October, 1908) of the *Canadian Forestry Journal*. Thirty cents each will be paid for each copy of these issues sent to the Secretary, Canadian Building, Ottawa.

With the Forest Engineers.

New Foresters.

At the June commencements of the various forest schools (namely, those connected with the University of Toronto, Laval University and the University of New Brunswick) a number of new forest engineers were graduated.

At the University of Toronto nine men received the degree of Bachelor of Science in Forestry, and three others are eligible for the degree after passing supplemental examinations. The fortunate recipients of the degree were Messrs. R. M. Brown, F. G. Edgar, E. J. Finlayson, H. S. Irwin, R. G. Lewis, C. McFayden, E. C. Manning, W. L. Scandrett and W. J. Vandusen. All of these entered the employ of the Dominion Forest Service. Their present disposition is as follows: R. M. Brown, forest assistant Brazeau forest reserve, Edmonton, Alta.; F. G. Edgar, forest assistant Bow River reserve, Calgary, Alta.; E. J. Finlayson, Inspector of Fire Ranging; R. G. Lewis, head office, Ottawa; C. McFayden, forest assistant, Crowsnest forest reserve, Pincher Creek; W. L. Scandrett, in charge of forest survey party near the Porcupine forest reserve No. 2, Saskatchewan; W. J. Vandusen, supervisor, Crowsnest forest reserve, Pincher Creek, Alta. Mr. Irwin has since joined the British Columbia forest service.

Laval University (Quebec) bestowed the degree of Forestry Engineer on seven men who had completed the course for the degree. These were Messrs. Henri Roy, L. J. Marquis, Felix Laliberté, Georges Boisvert, J. R. Gareau, Ernest Ménard and Borromée Guerin. All have entered the forest service of the province of Quebec, and are in charge of parties.

The University of New Brunswick conferred the degree of Bachelor of Science in Forestry on two men,

namely, Gilbert H. Prince and Guy A. Fitzrandolph. Mr. Prince has joined the staff of the British Columbia Forest Branch, and is working near Creston, in that province, and Mr. Fitzrandolph will go into the lumber business.

* * *

Mr. R. G. Lewis, B. Sc. F., has been for some time engaged in the compilation of the forest products bulletins for 1911 at the head office of the Forestry Branch at Ottawa. He will leave shortly for the Maritime Provinces, in connection with the compilation of the study of the wood-using industries of the Maritime Provinces on which the Forestry Branch is entering.

Messrs. G. H. Edgecombe, P. Z. Caverhill, F. W. Beard, E. G. McDougall and H. C. Kinghorn have resigned their positions in the Dominion forest service to accept positions with the Forest Branch of the British Columbia Department of Lands.

J. D. Gilmour, late of the C.P.R. forestry department, has been appointed supervisor of the Brazeau forest reserve, with headquarters at Edmonton.

L. R. Andrews has been appointed forest assistant on the Riding Mountain forest reserve, Manitoba.

L. C. Tilt has charge of a forest survey party in eastern Manitoba.

H. C. Belyea, who was a member of the 1911 forestry class of the University of New Brunswick, has taken a position with the Riordon Paper Co., at St. Jovite, P.Q.

G. Skiff Grimmer, of the U. of N. B. class of 1908, is engineer and forester for the American Canning Co., near St. Andrews, N.B. The company has a considerable tract of timber and will grow timber for box shooks.

G. A. Fitzrandolph (U. N. B., 1912) is joining the staff of the Baker and Randolph Co., lumbermen.

OTTAWA, CANADA.

Canadian Forestry Journal

VOL. VIII.

SEPT. - OCTOBER, 1912.

No. 5



CULTY OF FORESTRY

SIWASH ROCK, one of the points of interest near Vancouver.

THE CANADIAN FORESTRY ASSOCIATION.

Extends a cordial invitation to those interested in the forests of this country, from whatever point of view, to join its ranks, and help to spread knowledge of, and interest in, the forests of Canada in particular, and in general of the world. During the past few years the interest in the proper use and the protection and perpetuation of the forests has greatly increased, and to this increased knowledge and interest the Canadian Forestry Association, by its propaganda work, has contributed its share. Founded in 1900, with a membership of 12, it has in twelve years increased its membership to 2,700. During these years it has held conventions throughout Canada from coast to coast, in the Ancient Capital and in the bustling cities of the prairies and Pacific coast, in the manufacturing east and the agricultural prairie country. Its official organ, *The Canadian Forestry Journal*, was started in 1905 and is now in its seventh volume. But as forestry goes on, circumstances change and new needs spring up, and the Association is anxious to do its duty in arousing public interest and pointing out ways of getting things done. One object of the Association was achieved when forest reserves were established; but that is merely a beginning and now proper administration of these reserves, on the basis of the public good, irrespective of any private or partizan interest, must be secured. When that is done other problems will present themselves for settlement. The Association wants the interest and enthusiasm and, in some degree, the contributions of the public. The annual membership fee is \$1.00; this entitles the member to *The Canadian Forestry Journal* for a year, the annual report of the society, and other literature. Life membership costs \$10.00. Applications for membership should be addressed to James Lawler, Secretary, Canadian Forestry Assn., Canadian Building, Ottawa.

There are many ways in which we can serve our state and the future, but we can do it in no way as effectually as by growing trees in many places which are little adapted to other uses. It is possible to plant millions of trees in the ninety-two counties of Indiana, which will add millions of dollars annually to its wealth and, in the meantime, increase its beauty and the comfort of the people.—Former (U.S.) Vice-President Fairbanks.

CANADIAN FORESTRY ASSOCIATION.

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FORESTRY LITERATURE.

In reviewing the stock of literature on hand, the Association finds that there are a number of extra copies of certain issues of the *Journal* and Annual Report printed before the membership was as large as now. As these contain many excellent articles it has been decided to send them out as far as they will go. Members who receive such literature will know why it is sent.

The State Conservation Commission of New York has decided to use prison labor in advancing the forestry interests of the Empire State. It has directed the establishment at Comstock, where the Great Meadows prison is located, of a nursery large enough to bring the output of the state nurseries up to double its present amount; in other words, to increase the production to 12,000,000 trees per year.—*National Nurseryman*.

It is reported that an immense quantity of timber was destroyed by insects in the summer of 1911 in the neighborhood of Deer Lake, Newfoundland. The damage is estimated at over \$100,000, and the area covered is about 35 square miles.

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The Canadian Forestry Journal is a good advertising medium

Advertising rates on application.

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The Victoria, B. C., Forestry Convention.

Brief Report of the Proceedings of this important gathering.

What all agree has been the best and most instructive constitution of the Canadian Forestry Association concluded last evening in the Alexandra Club. Despite the distance which the great number of the members had to travel, the attendance at the convention was not far short

of that at any of the sessions held in the past - *Victoria Daily Colonist*.

The above complimentary reference shows that the Victoria Convention, in organic which a great many difficulties had to be overcome, was in the end amply successful. Two things in the main contributed to this. One

was the enthusiasm and cordial support of the government of British Columbia, and the other the assistance of members of the Canadian Forestry Association in eastern Canada, who made long journeys in order to be present at this meeting. Among these may be mentioned the Hon. J. K. Fleming, Premier of New Brunswick; Hon. Jules Allard, Minister of Lands and Forests, Quebec; Hon. W. A. Charlton, M.P., Vice-president of the Association; Mr. Aubrey White, Deputy Minister of Crown Lands for Ontario; Dr. B. E. Fernow, Dean of the Faculty of Forestry of the University of Toronto; Mr. R. H. Campbell, Dominion Director of Forestry, and a number of leading lumbermen, timber-limit holders and forestry officials. From Manitoba came the Hon. Colin H. Campbell, Minister of Public Works; from Saskatchewan Mr. A. F. Mantle, Deputy Minister of Agriculture, and from Alberta Mr. Geo. Harcourt, who occupies a similar position in that province.

The United States sent a number of representatives, including Judge Flewelling, President of the Western Forestry and Conservation Association, and Mr. E. T. Allen, Secretary of the same organization; Mr. Joseph B. Knapp, Assistant United States Forester at Portland, Ore.; Mr. Geo. M. Cornwall, editor of the 'Timberman,' and others.

The names of those who attended the different sessions of the Convention will be found in the list of delegates at the end of this report.

The sessions of the Convention were held in the commodious and handsome hall of the Alexandra Club, one of the few women's clubs in Canada which possesses a building of its own. It was originally intended that Sir Richard McBride, the Prime Minister, and members of the Cabinet should receive the delegates on Wednesday evening in the Legislative Chamber, but, owing to the amount of work which had accumulated on the programme, it was decided to change this

for the opening session in the Alexandra Club on Wednesday evening. This was a most successful change, as it permitted time for welcoming the delegates and for their replies thereto, which would have been impossible had this been reserved until Thursday morning. The change was also appreciated by the citizens of Victoria, who were thus enabled to hear the addresses of the distinguished men attending the Convention.

On Thursday afternoon His Honour the Lieutenant-Governor and Mrs. Paterson were 'At Home' to the delegates at a garden party at Government House, and on Thursday evening the lumbermen, in conjunction with the citizens of British Columbia, entertained the Convention at a magnificent banquet in the main dining-room of the famous Empress Hotel. The social functions were thoroughly carried out in the true style of Pacific Coast hospitality. The programme was filled with papers of the most practical character, and the discussions showed that keen interest was taken in every item. Before and after the convention delegates from distant points journeyed to different points along the coast, motored through Victoria and adjacent parts of Vancouver Island, and thus got a good idea of the flourishing Pacific Coast and particularly of its great timber resources.

Wednesday Evening, Sept. 4.

The chair at the opening meeting on Wednesday evening was occupied by Mr. A. C. Flumerfelt, Chairman of the Citizens' Committee which made the local arrangements for the convention. It may be mentioned in passing that Mr. Flumerfelt not only devoted a large amount of his valuable time to this convention, but that it was especially fortunate he should take a prominent part in it from the fact that he was chairman of the Forestry Commission upon whose report the present Forest Law of British Columbia is based.



Hon. W. R. Ross, Minister of Lands for B.C.

With the chairman on the platform were Sir Richard McBride, Hon. J. K. Flemming, Hon. Jules Allard, Alderman Herbert Cathbert, representing His Worship the Mayor, unavoidably absent on civic business in Ontario, Mr. J. J. Shallcross, President of the Board of Trade, and Mr. John Hendry, President of the Canadian Forestry Association. Mr. Elmendorf to use his own expressive phrase, "touch-
ed the button" and the proceedings began.

Sir Richard McBride warmly welcomed the convention to British Columbia and spoke of the honor done the Province by the gathering in it of such a distinguished body of men. He recapitulated the circumstances

which led to the formation of the British Columbia Forest Service under the Hon. W. R. Ross; he reminded the audience that British Columbia had now the most modern legislation on forest matters on the continent, the result of careful inquiry by a Royal Commission on Forestry and its equally careful consideration given by the Government in this respect. In organizing the Forest Service the greatest care had been taken, with the result that he believed they had a body of trained foresters not to be equalled on this continent. The results were shown in the wisdom of selection, and nothing would be left undone to make the Forest Service thoroughly efficient in every part of its work. He

acknowledged the assistance given to the Government by the lumbermen, timber-owners and the general public in enforcement of the laws; on every hand was evident a desire to protect the forests and husband the immense timber resources of the Province.

The citizens' welcome was conveyed by Alderman Cuthbert, and that of the Board of Trade by Mr. Shallcross. The first called upon to reply was the Hon. J. K. Flemming, Premier of New Brunswick. He thanked the Province and City for their warm welcome and complimented very highly British Columbia in showing the way to solve the larger problems of forest protection.

The Hon. Jules Allard, while he apologized with true French-Canadian politeness for his English, proved how little he needed to ask any indulgence. In eloquent terms he congratulated the Government of British Columbia on what it was doing for forestry and for the protection of the natural resources generally. He showed the progressive step taken by Quebec when it sent two young men to Yale to be educated as foresters, and that these men had been placed in charge of the work on their return, and he also spoke of the success of the new forestry school established in connection with Laval University, ten graduates of which were in the employ of the Quebec Government.

Mr. Aubrey White, on behalf of the province of Ontario, thanked the people of British Columbia for the welcome extended and spoke of the efforts of Ontario to conquer the forest fire demon by constantly increasing the organization since 1885.

The Hon. Colin H. Campbell said that this was the first forestry convention to which his province had been able to send a representative. Formerly Manitoba had been engaged in producing No. 1 hard wheat, but now, thanks to the extension of its boundaries, it was interested with

other provinces in forest problems.

Dr. Fernow spoke on this occasion as representing the Commission of Conservation. He congratulated the province on its remarkable advance in forest matters. He agreed with the Premier that he was right in considering the British Columbia legislation the most advanced in America. The thing that struck him most was the rapidity and effectiveness with which British Columbia had completed its work.

Mr. John Hendry brought the proceedings to a close by a speech in which he conveyed the thanks of the Association.

Mr. R. H. Campbell, Mr. James White, Secretary of the Commission of Conservation, Mr. A. F. Mantle and Mr. George Harcourt had promised to speak at the opening, but owing to the lateness of the hour it was decided to reserve these speeches for another session.

The Hon. W. R. Ross, Minister of Lands for British Columbia, who had made a race against time from New York in order to be present at the convention, arrived before the close of this session and was greeted with cheers.

Thursday Morning, Sept. 5.

The proceedings opened with Mr. Hendry, the President, in the chair, and he immediately proceeded to deliver his presidential address. In this he pointed out that the public was now coming to realize that the old idea that forests and lumbermen must disappear as time passed was giving place to the new conception that forests would continue forever on the lands unsuited to agriculture, and that the ideal was permanent saw-mills and wood-working factories supplied with timber from permanent forests on the non-agricultural lands. He emphasized the need of much greater exertions against fire, and also better laws to keep out 'fake' settlers from agricultural lands. To this end surveys should be made as rapidly as possible to ascertain what is absolute forest land, and the forest services all over Canada should be kept fearless and non-partizan by placing them under civil service regulations, whereby appointments, promotions and dismissals



Some of those present at the Victoria Convention.



What Fire has done in some British Columbia Forests.

should be made upon merit. Reference was made to British Columbia's great timber wealth and to the new Forest Law.

Sir Richard McBride and Hon. W. R. Ross were commended for their activity in the matter of forest conservation and development, and the delegates from other provinces welcomed in coming to assist in solving the forest problems not only of British Columbia but of all Canada, as the gathering would not lose sight of the national character of the Canadian Forestry Association.

HON. W. R. ROSS.

The Minister of Lands, in preface to his paper on 'The Guardianship of the Forest Wealth of British Columbia,' referred to the premier's remarks the evening before. Sir Richard, he said, had made it plain that this province, so far as the others are concerned, proposes to take the lead in matters affecting the modern policy of conservation of forests. It was particularly fitting that the present convention should be held in Victoria, as it gave British Columbia an opportunity to give firsthand notice to its friends from other provinces that from now on it would expect that for the latest word in forest conservation all must come here.

Mr. Ross, in his paper, traced briefly but concisely what has been done in British Columbia for the protection of the forests, and explained fully the composition and working of the forest branch of his department, starting his review from the appointment of the forestry commission, the work of which he praised highly. In the course of the paper he said:

TIMBER RESERVES.

'Since the end of 1907 no timber has been alienated by the government, and, while making provision for timber sales in the Forest Act last session, I was most

anxious to avoid burdening the new staff with much detail work of this description during the important organizing period of this year. The only sales we are putting in hand at present are those of small areas of timber that operators are anxious to take out while working on adjoining land, there being no question as to the desirability of disposing of these. In order to continue our policy of encouragement to the paper and pulp industry, we are conducting investigations of certain areas which are reported to be specially suitable for the production of pulp.

'Another duty falling to the forest branch is that of land classification. We have such enormous areas in this province that are extraordinarily fit—and fit only—for the growing of timber that every effort should be made to cut out from our timber reserves, as soon as possible, all land suitable for agriculture. Forest assistants with technical training have therefore been assigned to the examination of cut-over timber limits and leases in order that our departmental action may be based on accurate information. Fraudulent attempts to secure timber lands under cover of the Land Act will be balked by similar examinations.

'In the short time at my disposal, I but mention a few of the other matters that are receiving attention, for instance, the examination of certain regions in the interior, where it is feared that the forest is failing to reproduce itself; the special study by trained men into the effects and defects of the log scales in use in the province; the publishing of reliable information that will advertise our B. C. timbers and our forest industries; the study of waste in all its forms; and the campaign of publicity that we consider the most valuable, in fact, the fundamental, means of combating the public carelessness that

is chiefly responsible for the fire danger. And this, gentlemen, brings me again to that important phase of our work—forest protection.

FOREST PROTECTION MEASURE.

'I have already mentioned the fact that we practically doubled the fire warden force for the season of 1911. The government at this time was carrying on the work at the public expense, and it was very generally agreed that owners and holders of timber lands ought to be required to contribute their proper share. The Forest Act therefore, established the Forest Protection Fund, to which all owners, lessees and licencees of timber lands are required to contribute, the government putting up dollar for dollar. The standard levy is one cent per acre, with the proviso that whenever this proves insufficient to meet the annual expenditure there shall be an automatic increase to whatever figure may be necessary.

'We have found it desirable to create new fire districts during the present season, chiefly on account of the rapid settlement that is taking place in the regions north of the railway belt, and in conse-

quence the Inspection Divisions have been increased from ten to fifteen; but owing to the frequent rains this summer, and the prompt attention that has been received, the expenditure has been well within the amount available. By October 1, forest protection will have cost this year under \$180,000. Refunds from the C.T.F. of half the expense of patrol and fire fighting in the regions traversed by their line and from the C.N.R. of all expenses incurred in supervising their contractors will reduce the amount chargeable to the forest protection fund by nine or ten thousand dollars and as the income of the fund is about \$230,000 there will remain available for improvement work in the autumn a sum of about \$50,000.

DESTROYING STUMP.

'I have watched with great interest the controversy that has raged in other provinces and states as to whether operators should or should not be compelled to burn or otherwise dispose of lumbering slash. The solution adopted by us has been to leave the matter in the hands of the forest service, which is empowered to deal with this slash at the expense of the for-



Ranger's Cabin in Chilliwack District, B.C.

The ranger's cabin shown in this illustration was built by Mr. A. B. Hickey, employed by the Forestry Branch as foreman in the Chilliwack District of British Columbia. It was built during the summer months of 1911 at a cost (Mr. Hickey's time not being included) of \$41.00.

est protection fund, so as to favor the growth of the new crop of timber and to give it as much protection as possible against fire. This work and the clearing up of dangerous debris alongside public roads and in other specially dangerous localities will necessitate a slash-burning campaign in many portions of the province. Experiments already made by us in this line have proved most successful.

ATTITUDE OF PUBLIC TO FIRES CHANGED.

'We are all conscious of the remarkable change that has taken place in public opinion with regard to forest fires. Ten years ago people in the west looked upon the burning of entire watersheds as a natural alteration in the scenery that went with railway construction, mining or land-clearing as a matter of course. There was a good deal of wagging of heads at such wholesale destruction, but the prevention or controlling of forest fires seemed to be too big an undertaking, and there was consequently a general feeling of helplessness in the matter. That was so even five or six years ago. Today in this province there is an outcry if precautions are not taken to prevent fires in places where dangerous conditions exist, and when fires occur people expect the fighting of them to be organized promptly, and look for just as much money to be expended as the circumstances require.

'Public opinion, in other words, has been educated to higher standards, and this result has been accomplished almost entirely by the steady publicity that forest protection has received through the press, through public speaking, through the efforts of forestry associations, and through the enforcement of the permit law and other local work.

WASTE IN MANUFACTURE.

'Six years ago we in this province felt powerless to prevent the annual waste by fire; today we see our way with confidence. If one great problem can thus be solved, why not another? Today, for instance, each million feet of lumber manufactured on the Pacific Coast means the wholesale butchery of low-grade material for which our operators can find no market.

'Other waste there is that is preventable, for example, the using of high-class material in the woods for purposes for which inferior timber would suffice, and the cutting of lumber into even lengths only, on account of which trade practice investigation shows that two per cent. is lost; but before the main problem of the low-grade log, we are as helpless today as we were regarding fire protection a few years ago. I look to co-operation between the operators of this province and the forest service, in order that this disease of waste that affects our forest may be

studied as carefully as doctors study human diseases and that every possible way of improving matters be discovered and made use of.

'Time forbids that I should say more on this occasion, and I will confine myself to emphasizing one final point. The conservation movement has succeeded in making the public realize that, region by region, and state by state, many of the forests of this continent are being cut out. It is human nature for people to console themselves with the thought that the forests will last their time and that nothing much can be done.

'I think that it is just here that the failure to give people a real interest in forest business has occurred. . . . What we need to drive into the understanding of the people is that forestry, as we practice it, means the scientific management of the government's immense timber business, so that the citizen who would otherwise have to pay \$15 in taxes has only to pay \$10; so that in years to come the citizen will have to pay still less; so that while producing these effects on revenue, the system of forest finance will be so adjusted as to offer the maximum of encouragement to the growth of the lumbering industry; and, above all other considerations, so that our forest capital, the source of our prosperity, may be preserved intact.'

COMMITTEE ON RESOLUTIONS.

The Resolutions committee named by the president was composed of Hon. W. R. Ross, Mr. R. H. Campbell, Dominion Director of Forestry; Dr. Fernow, dean of the faculty of forestry of the University of Toronto; Mr. Aubrey White, deputy minister of lands, forests and mines of Ontario; Mr. Wm. McNeill, Vancouver, and Mr. A. C. Flumerfelt, Victoria.

LUMBERMEN APPROVE FOREST ACT.

Mr. T. F. Paterson, B.S.A., representing the British Columbia Lumber and Shingle Association, read a paper on 'The Forest Act of British Columbia as Viewed by the Coast Lumberman.' On the whole, he said, the lumbermen thought the act a good one, and were prepared to co-operate with the forest branch in carrying out a policy of conservation. Not knowing the members of the service yet, he refrained from any criticism of them, but accepted the minister's statement that the best men were being selected. In the appointment of fire wardens and log scalers, he said the lumbermen desired to see no man given a position unless he was a man of some ability and experience. They recommended an examination for scalers, and the appointment of fire wardens for the year round at adequate salaries.

From the experience gained in a recent trip to Ontario Mr. Paterson declared that he was satisfied British Columbia had a far greater amount of merchantable timber. A lot of timber from sixteen inches down was left in the woods here, but the time was near at hand when this would have to be utilized by the lumbermen.

THE NEW B.C. FOREST SERVICE.

Dr. Fernow assured the association that the young men who had entered the forest service of British Columbia were not only trained foresters, but men of common sense, whose work would result in benefit to the lumberman as well as to the country gen-

erally. Along railway construction work the government had staffs of rangers under supervisors and the companies paid half the expense. On Government reserves the Government appointed and pays all the rangers.

FOREST ENEMIES.

Mr. R. H. Alexander advocated the payment of all the cost of fighting fires out of the forest insurance fund. He opposed the allowing of settlement on or adjacent to any lands best fitted for timber growing. For the lack of market for lower grades of timber, Mr. Alexander blamed the consumer to a considerable extent and the habit of using clear limbers, that fire taken right



Cedar Forest on Columbia River, B.C.

erally. Dr. Fernow recalled that in the earlier days of forest conservation the lumbermen were not so friendly as they had now become. They did not have a vocabulary wide enough to say all the complimentary things they desired about the foresters and their policy, and so they invented "demadics" (sic) "demadics" with the same ending as lunatics (laughter). It was doubly pleasant, therefore, to see the spirit of co-operation now manifest.

Mr. R. H. Campbell and Mr. Asbjørn White spoke along the same lines and congratulated the province on securing Mr. H. R. MacMillan as chief forester. Mr. White explained that in Ontario the lumbermen now pay the whole cost of fire protection, on their limits and appoint the fire rangers, these being under the supervision of five district rangers appointed by the govern-

ment. Along railway construction work the government had staffs of rangers under supervisors and the companies paid half the expense. On Government reserves the Government appointed and pays all the rangers.

Mr. Paterson warned the lumbermen against the bogus prescrip-

Chief Forester MacMillan thanked the gentlemen who had spoken for their kind references to the B. C. forest service and the lumbermen generally for their co-operation with the department. As the service became better organized, forest reserves would be established. These would be logged off as fast as the timber matured, would be protected from fire, and thinned up as to secure the reproduction as best as possible of the most valuable forest trees.

A telegram of greeting was read from Mr. W. A. Austin, secretary of the Manitoba Lumbermen's Association.

ECONOMY IN MANUFACTURE.

Mr. E. J. Palmer, president of the B. C. Lumber and Shingle Association, read a paper on economical manufacture. He emphasized the need for utilizing the timber now wasted and declared that a market could be established for it. There was some education of the public necessary, however, and it would be well for governments also to take a hand and for railways to co-operate by granting lower rates for the transportation of cheap grades of lumber. The statement had recently been made to him (Mr. Palmer) by a prominent railwayman that coast mills annually wasted fifty thousand carloads of lower grades. Mr. Palmer cited numerous uses to which these grades could be put. He mentioned the case of limits logged over fifteen years ago, which his company is now logging again and getting twelve thousand feet an acre off, the reason being that there is now a market for the smaller timber which it would not have paid to cut when the limits were first logged.

FORESTRY IN QUEBEC.

Mr. G. C. Piché, chief of the forest service of the department of lands and forests of Quebec, congratulated British Columbia on having such a splendid forestry system now in effect. In Quebec the government is now engaged in a classification of lands which are suitable for agriculture, and those which are fit only for timber. There is strict control of logging operations, as to taking out all the merchantable timber and so forth. The disposition of debris is a matter still for the future, and will require lengthy experiment, Mr. Piché said. He gave the convention some interesting details of the forest service of his province, and the work which is being done in reforestation.

Mr. A. C. Flumerfelt urged the adoption of a resolution by the convention asking the Dominion government either to put the interpretation desired by the lumbermen upon the question of duty on common lumber, or else to change the tariff so as to preserve to the British Columbia lumbermen the prairie market for low-grade lumber that properly belongs to them.

Thursday Afternoon.

At the afternoon session, Mr. George M. Cornwall, secretary of the Pacific Coast Logging Congress, and editor of *The Timberman*, Portland, gave a paper on 'Logging as an Engineering Science.' He said that the profession of the logging engineer, though it had not been officially designated as a part of the service, was nevertheless a useful and honorable profession. He then went on to explain a course of study which he suggested should be made part of the university curriculum in order to fit young men for this occupation.

A general knowledge of the general principles of steam, electricity and hydraulics, he said, is essential; also the student should acquire an actual working knowledge of the cutting and removal of timber, and should be a man of broad sympathies, capable of looking after the men in camp. A man so trained would be very valuable for the reason that his skill would enable him to reduce the cost of logging. The difference of a dollar in cost is easily made, and would amply pay for the training involved.

The logging engineering course in a college should consist of three departments, which should be in charge of a practical logger, a cruiser and estimator, and an instructor in mechanical and civil engineering. The student should spend at least eight months in the bush and a certain time in a machine and blacksmith shop. He should learn to cruise and estimate timber; should have a practical knowledge of civil and mechanical engineering, and should be able to make topographical drawings with accuracy. A course of study of this kind would turn out an expert lumberman in the broadest sense.

The Pacific Logging Congress, in its recent sessions at Tacoma, appointed committees for the various coast states and British Columbia, with a view to having the subjects taken up in the universities, and he was glad to say that the government of British Columbia had expressed its sympathy with this.

Dr. Fernow opened the discussion and led on to a consideration of education in forestry matters. He recalled that the first graduate of Cornell school of forestry, over which he had presided, while not trained practically, was now a logging engineer and professor of that science in Yale school of forestry. The last student, because the school failed from political reasons, was in the audience.

Mr. James Macoun, C. M. G., who had lately visited Strathcona park declared that British Columbia had every other part of the Dominion 'trimmed' in the matter of fire protection. Whoever was responsible for it, the fire wardens kept notices up so frequently and constantly that one 'got the habit,' and even when they had put fires out, they went back to see if they were out.

'That region is certainly the finest part of British Columbia,' said Mr. Macoun, in conclusion. 'Not that the trees are the largest or the best, but there is the largest primeval forest on earth, and it should be preserved. There are there the finest examples of Douglas fir you can find. The government is certainly to be highly commended for the steps it is taking to make this a national park.'

Rev. C. W. Houghton told of the work the Columbia Coast Mission is doing for the men in the logging camps. This mission aims to do for the loggers and fishermen of the Pacific Coast what the Liferiffell does in Labrador. It maintains a hospital ship, several hospitals and a staff of doctors and nurses, in addition to the mission staff and endeavors to assist the men in all ways. The need of \$10,000 for the purpose of assisting the medical work of the Columbia Coast Mission, was referred to by Mr. Houghton, who asked that the delegates do what they could towards assisting in the work. The mission, he said, had hospitals on the coast and had the medical boat Columbia well equipped, even with an X-ray apparatus.

of the Empress Hotel, was a great success, and one of the most important social functions in which the Association has been asked to participate.

As the leading entertainment of the evening, Mr. John Hendry occupied the chair, and Mr. A. C. Plummer, chairman of the provincial committee of arrangements, acted as toastmaster. Carvers were told for two hundred, and nearly every place was occupied, there being in fact 750 present. Due to the large number of distinguished gentlemen present, private municipalities, speakers, members of provincial cabinets, administrators, etc., the speakers only were seated at the head table. On the right of the chairman were Sir Richard McBride, Hon. W. A. Giesler, M.P., Mr. W. F. Allen,



Government House, Victoria, B.C., where the Delegates to the Convention were entertained on Thursday Afternoon.

status. At Rock Bay, he told the delegates, 45 lives had been saved through the agency of the salmon hospital.

The Garden Party.

The convention adjourned at four o'clock to allow the delegates to attend the garden party at Government House given by His Honor the Lieutenant Governor and Mrs. Paterson. The weather was most suitable, and a very pleasant hour was spent by the company in the beautiful grounds of the gubernatorial residence.

The Banquet.

The banquet rendered the delegates by the lumbermen, with address of Arthur Columbia, in the magnificent dining room

of Portland, Ore., Mr. B. H. Campbell, Dominion director of forestry, Mr. C. H. Lorge, editor of the *Columbian*, and Mr. A. C. Plummer. To the left were Mr. James Duff, Hon. C. D. Campbell, Minister, Mr. G. H. Bayne, M.P., Hon. J. K. Finlayson, premier of New Brunswick, Mr. William McNell, Vancouver, director of the Canadian Lumbermen's Association, and Hon. W. A. Giesler, Minister of Lands.

The dinner was most satisfactory, there were thirty speeches on the banquet list, yet the service was so good and the speaking so well in the quiet that the last guest was out of the banquetting hall half an hour after midnight. It was noted by all those that the speaking was of a very high order.

The Delegates at Upland.

The toast of "The King" being heartily bestowed, Mr. James C. F. Galt, of

the supreme court of Canada, proposed 'The Dominion of Canada' in a happy speech, which was worthy of the occasion and was also noteworthy in that it was his first public speech in British Columbia since his elevation to the bench. He preached the gospel of the solidarity of Canada as demonstrated by the developments of the past few years, and accepted the politicians' declaration that Canada was a nation; but doubted whether the average Canadian accepted all the responsibilities attaching to that status.

'Do we realize how much of the burden has been borne by other shoulders? I cannot, of course, infringe upon politics or political questions at all, but I am convinced that Canadians will always do their duty by their own country and by the Empire, and will never be actuated by the craven fear of being great.'

Mr. G. H. Barnard, M. P., responded on behalf of the Parliament of Canada, and after dwelling upon the commercial and national development of the Dominion, asserted that it would ever be the pride of Canadians to remain true to the traditions of the lands from which they sprung. He was glad to be able to say that the lumbermen of British Columbia had found a better reception in Ottawa within the past year than they had in previous years and promised them an equally welcome reception whenever they visited Ottawa again during the present political regime. The people of British Columbia recognized that the timber industry was the basis of this province's prosperity and many of them, like himself, lived in hope that eventually all the taxation of the province would be paid by the timber industry and thus relieve the ordinary man of the burden of taxation. Mr. Barnard paid tribute to the great work done for forestry by the late Sir Henri Joly de Lotbiniere, so long beloved in Canada and especially in British Columbia, and was convinced that if the late lieutenant-governor were alive today no one would have been more proud of the progress made in forestry in Canada, and especially in British Columbia, than he.

THE PROVINCE OF B. C.

The toast of 'The Province of British Columbia' was proposed by Hon. Colin H. Campbell, the minister of public works of Manitoba, who expressed his sincere pleasure in paying honor to the province which by its firmness had created itself the cement of the confederation.

British Columbia had manifested its faith in the unity of Canada in many ways, but in none more substantial than in its insistence upon the terms of the confederation agreements. It had taught Canada, as he hoped that Canada would

teach the rest of the world, that a country must stand by its treaties and obligations. British Columbia was the hope of the Dominion of Canada. Who could predict its future? What belonged to British Columbia belonged to Canada as a whole and he who would drive in the wedge of cleavage was an enemy to the country and to the empire. The country had difficulties to face, but it would face them with confidence and with courage, confident that so long as its destinies were confided to the hands of men like Sir Richard McBride they would be safe.

The toast was honored with enthusiasm, which was renewed as Sir Richard McBride rose to respond. The premier admitted his pleasure in having assisted Manitoba to secure its rights and legitimate claims, and promised that if there was anything which Manitoba wanted, 'even after it had now secured an Atlantic seaboard,' the province of British Columbia would be glad, now as ever, to assist her or any other of the sister provinces.

He might, he said, have dwelt upon the fisheries, the minerals, the fruit-growing possibilities and the climate of British Columbia, but the visitors knew of all these things.

'I would like you to think of this province,' said the premier, 'as the western part of the Dominion, and not as a distinct portion of the federation of provinces. We who are entrusted with the administration of affairs here feel that we are not trustees for this province alone, but that we are trustees for the whole Canadian people, and that we have a duty in the discharge of that trust to consider the interests of our brother Canadians dispersed east of the Rockies quite as much as we are bound to consider the interests of Canadians west of that mountain range.' (Cheers.)

The premier spoke of the consolidation of the forest and land laws which had been made by his colleague, the minister of lands, which would be found to embody workable enactments, reasonable arrangements and fair and equitable treatment of all who might be interested in the lumber industry. Those interested in the work in this province looked not only for inspiration, but for information to the gathering of the Forestry Association in the city. To the very extensive growth of business in the province and its capital there was now to be added all that was to be expected from the completion and operation of the Panama canal. The value of this new highway of the world's commerce to the lumber industry could not be overestimated, and nothing he could say would be extravagant.

Sir Richard repeated his belief, frequently expressed of late, that in the final result the American people would be found to act fairly and justly in the matter of the imposition of tolls and the treatment of British shipping on the Panama canal, and that as soon as the present political situation had passed, the United States would realize its treaty obligations and live up to them.

'We have the right to expect neighborly treatment from our neighbors, and we believe that we shall receive it.'

U. S. VISITORS REMEMBERED

Mr. R. H. Campbell, the Dominion Director of Forestry, proposed the toast of 'The Forest Interests of the United States of America,' and, in doing so, laid emphasis upon the close relationship which existed between Canada and the United States, not only socially and commercially, but personally as well, and expressed his hope that this close relationship would always continue. Both countries had been equally prodigal in their treatment of their natural resources; but both had now awakened to a realization of the need for conservation of those gifts which God had given to both. Much of this knowledge had come about as the result of the labors of men such as Dr. Fernow, to whom both countries owed a debt which could never be repaid.

Mr. E. T. Allen, of Portland, Ore., U. S. A., replied in a happy speech which breathed the sentiment of brotherly love. At the outset he paid a compliment to British Columbia by describing its forestry law as the most advanced forestry legislation on the continent. While there had been an opinion in the United States that Canada had drawn largely upon American sources for its forest experts he was going back to tell his folk at home that they might well borrow a few Canadians to teach them some things. Much more was involved in such gatherings than sentiment. They involved business principles and business treatment of business questions and in that regard each could learn from the other.

'We may call our work forest conservation or forest preservation as what you will. I prefer to call it national and public insurance and it should be administered just as wisely and just as surely as if it was a matter of personal insurance.'

Even though British Columbia had an excellent law, there were still some things which it might learn from the United States. One of these was to teach that all sections of the community had a common interest in the forestry movement, no matter whether governmental, lumbermen or the ordinary public. In the state of Washington, Oregon and Idaho, the timber owners were patrolling 30,000,000

acres and doing their share in a common business contract with the rest of the community. The problems of the two countries were the same. Such problems respected no geographical position. They should be solved by the forest brotherhood of the Anglo-American peoples in a spirit of comradeship and cooperation.

THE ASSOCIATION HISTORIC

The toast of 'The Canadian Forestry Association,' was proposed by Mr. William McNeill, of Vancouver, Director of the Canadian Lumbermen's Association, who, in a witty and felicitous speech reviewed the growth of the association and the development of its work and emphasized the unity of interest which bound eastern and western Canada in the conservation of natural resources, such as forests, fish and lands.

'We are only beginning to peep in this province, but British Columbia has always been a dominant, a compelling province, and it will so continue to be. The next forward step in the conservation of the forests had rightly been taken by the province of British Columbia, the province which was the guardian of the interests of the whole of Canada.'

Hon. W. E. Hall responded both as minister of lands of British Columbia and as a vice-president of the Canadian Forestry Association, and dwelt more on the expansion which was inevitable in the timber industry of British Columbia. He assured his hearers that the government of British Columbia was animated not only by the necessities of the day, but also by the requirements of the future. British Columbia was the Imperial province in regard to the forests. It had duties and obligations to central Canada, and it came with that knowledge and that ideal that the government had set its face against the delinquency of the forest resources of the province. He expressed the hope that the new provincial university would include a school of forestry engineering with practical work of timber and timber conditions.

'I saw the cotton pine of California some days before the Douglas fir of British Columbia,' said the minister amidst loud cheers.

Hon. W. A. Chubb, M.P., the vice-president of the association, also smiled, expressing the belief that through the hospitality of the people of Victoria, the association had no danger of being killed by kindness. The Toronto convention showed that the Canadian Forestry Association was no longer a youth, but had grown to manhood. He was especially glad to know that the provincial government had decided to make all appointments to the forestry service without regard to politics and would take the most

sage back east that men of the east came here to sit at the feet of the giants of the west in forestry knowledge. 'The better we know each other, the better we shall love each other,' was now as ever the motto of the Forestry Association.

The final toast of 'The Press' was proposed by Hon. J. K. Flemming, the premier of New Brunswick, and responded to by Mr. C. H. Lugrin, who dwelt upon the great asset which Canada possessed in its practically transcontinental forest, and urged that 'we should take as much care of that forest as we should of a transcontinental railway. If one of our railways were to be destroyed it could easily be replaced within a few years, but it would take generations to replace the great transcontinental forest which was the backbone of Canada.'

able timber and valueless for any other purpose, at 65,000,000 acres, this being a conservative estimate. Of this, he put down 25,000,000 acres as being rendered unmerchantable under existing conditions by fire, but containing considerable amounts of large timber and coming rapidly into second growth. It was certain, he said, that within ten years the forests would increase their annual cut to four or five billion feet, while in twenty years the production would be limited only by the supply. This limit of supply of six billion feet a year would be reached in fifteen years. This was worth to the government \$6,000,000, and to the community \$100,000,000 a year, and to win this stake fire must be kept out of an area of one hundred million acres.

Mr. Benedict explained in detail the or-



Burned-over Benchland near Revelstoke, B.C.

The proceedings closed by the drinking of the health of Mr. John Hendry, the president of the association, 'one of the greatest captains of industry in Western Canada,' as Sir Richard McBride described him.

Friday Morning, Sept. 6.

At the opening of the morning session, in the absence of Mr. R. E. Benedict, assistant forester of British Columbia, Mr. M. A. Grainger, chief of the department of records, read his paper on 'The Protection of the Forests of British Columbia From Fire.' Mr. Benedict placed the acreage capable of producing merchant-

ganization of the fire-fighting force and the fire protection fund of two cents an acre, half contributed by the timber owners. He insisted on the necessity of most thorough forest patrol. Despite all laws and their strict enforcement, fires would occur, just as in a city, and the complement of expensive city fire departments was necessary in the forests in well-organized patrols. This would cost money, but the stake was well worth all that could be spent.

Chief Forester MacMillan stated that the province now has 142 fire rangers and wardens, each having an average of 500,000 acres to look after. It would be ne-

cessary to reduce this area to something like 30,000 acres per man. To properly cover the province there should be 7,000 fire wardens per season, and this stage must be reached. The number might seem large, the chief forester said, but in Ontario there were over 1,000 wardens in service during the season.

Speaking after Mr. Benedict's paper, Mr. Maurice Quinn, of Saginaw, Mich., U.S.A., referred to the lack of fire protection in the Alberni district, where he said in the case of a recent fire on Cameron Lake mountain there was no one present to send word of the danger and no one appeared to be interested. He spoke of an urgent necessity for the education of the people in the vicinity in regard to the danger of forest fires. He asserted the work should be the combined care of lumbermen, farmers and railways. On Alberni Canal the speaker instanced the special difficulties met with. Alberni Canal, he said, was fifty five miles in length with high mountains on the shore line. Men found it impossible to climb the mountains, and to obtain assistance boats are necessary. In the event of a fire occurring at Great Central lake, he said, ten million feet of lumber would be destroyed before a fire-fighting force could be assembled to cope with it, and prevent its spread. The only remedy, said the speaker, was the expenditure of money in the provision of conveniences for transmission of information and the maintenance of an efficient fire fighting force. His plea for efficiency in fire-fighting forces was supported by the other speakers.

RAILWAY FIRE SITUATION.

Mr. Clyde Leavitt, chief fire inspector for the Board of Railway Commissioners and Forester of the Commission of Conservation, read a paper on 'The Railway Fire Situation in Canada.' In part he said:

'While many fires have been attributed to the railways, for which they were not, as a matter of fact, responsible, the loss from this source has nevertheless been far more than the country could afford. Forest fires are practically preventable, but to accomplish this it is necessary to spend money for preventive measures.

'The Board of Railway Commissioners for Canada has had the matter of forest fires under consideration for several years and has issued regulations from time to time. The latest order of the board on this subject was issued May 22, 1912, and provides for the use of spark arresters, the non-use of lights and the establishment and maintenance of fireguards, the regulation of the burning of inflammable material along rights of way, the organization of special patrols for the railway companies and other measures by such

companies necessary to the discovery and extinguishing of fires along rights of way. The two latter are the most important new features of the new order, since most of the other provisions were previously in effect.

'For the administration of these provisions of the order and the inspection of the work of the railway companies under it, a co-operative plan has been developed with the forest branch of the department of lands of British Columbia, and with the forestry and parks branches, Dominion department of the interior. Certain officials of these departments have been appointed officers of the board with authority to deal direct with the railway companies and to vary the requirements up or down, as local conditions at any time or place may require or permit. In this way a perfectly elastic system is provided, so that efficient protection is assured at a minimum cost to the railway companies and with a minimum of red tape and loss of time.

'Patrols under this plan are now in effect at the cost of the railway companies on the Canadian Pacific, Canadian Northern, Grand Trunk Pacific and Great Northern railway lines in the forested sections of British Columbia, Alberta, Saskatchewan and Manitoba. The plan is working very satisfactorily so far. It is expected that a similar system of railway patrols will be established under the new order in the eastern provinces next spring. The railways are directly interested in preventing forest fires to a great or extent than any other single interest in the country.

'The patrols specified by the chief fire inspector have in every case been fully discussed in advance at conference with railway officials, so there is no reasonable ground for a charge that anything wrong has been done.

'The gradual extension of the use of electricity and oil as power sources will be expected to materially decrease forest fire danger.

'In order to be thoroughly consistent and to secure the full benefit of the plan outlined for the prevention of railway fires, steps should now be taken by the Dominion and Provincial governments for the disposal of inflammable material resulting from the construction of wagon roads, and also for the removal, either by burning or by loading and delivery, of all trash resulting from logging operations. Old debris along railway lines should be removed as rapidly as possible. Only in this way can efficient fire protection be secured at a reasonable cost.

'The administration of the new fire regulations should give Canada the best system for the prevention of railway fires on the continent.'

Discussing Mr. Leavitt's paper, Mr. E. H. Finlayson, of the Dominion Forestry Service stationed in Alberta, Saskatchewan and Manitoba, told of the harmonious results obtained since the first arrangement of fire patrols on the prairies. Rangers are now established in sections that can be covered once a week. He said that patrols would be found cheaper than fire-guards.

Mr. James White, secretary of the Commission of Conservation, followed with a reference to the old law whereunder the onus of proof of fires from railway causes rested with the prosecutor, and spoke of its alteration by Hon. Geo. P. Graham, who caused amendments to the effect that railways should provide fire-fighting forces, and bear the onus of proof. The fact that British Columbia did not agree on the matter of oil fuel for rail-

ion Forest Reserves for Alberta, read a paper on 'The Organization Work of the Dominion Forest Service in Western Canada.' In this he sketched the size of the Rocky Mountains Forest Reserve of twelve million acres, one of the largest on the continent. He showed its resources in timber, minerals, water-powers and game, and spoke of its high value from a scenic standpoint. The reserve had been divided into five administrative units, varying in size from one million acres to four million acres, each in the charge of a Forest Supervisor. Some of the problems presented were given. There were no maps of the district, not even such as might be made by rapid reconnaissance. The Forestry Branch had neither funds nor equipment for this work, but was endeavoring to get the Topographical Surveys Branch to undertake it. There was no knowledge of



An Example of Wasteful Lumbering in British Columbia.

ways after 1914 was also mentioned, the provincial opposition being on account of the detriment to the coal-mining industry. Mr. White bore testimony to the value of the work being done by Mr. Leavitt and urged that in order to secure absolute control of all railways the provincial governments should adopt similar regulations to those put in force by the railway commission in regard to lines under federal jurisdiction.

Mr. Charles F. Lindmark, Revelstoke, intimated that he would later bring before the association a resolution recommending the placing of the forests in the control of an independent commission removed from politics.

Mr. W. N. Millar, Inspector of Domin-

the kind and state of the timber. While the reserve was under the Forestry Branch, the regulations as to cutting were under the Dominion Lands Office. When the making of these regulations was transferred to the Forestry Branch the latter must study carefully the question of disposal of 'slash' as related to reproduction and the keeping down of fires. A better standard of qualification for the rangers was advocated, and in this regard better terms and more permanency of employment and the separation of the service from politics.

REDUCING WASTE.

Mr. J. B. Knapp, assistant district forester in the United States Forest Service,

spoke on the closer utilization of Pacific Coast timber, and pointed out the many instances in which waste was allowed which was unnecessary, both in the woods and the mills. He placed a good deal of blame on the retailer and consumer for some forms of waste, as, for instance, in the insistence on lengths of even feet, which led to much waste in trimming in the mills. A recent attempt by saw-mill men to introduce the use of odd-foot lengths was defeated by the consuming public refusing to take these. Mr. Knapp also referred to the lack of science in the handling of dry kilns, which he charged with a waste of from ten to forty per cent., largely unnecessary, and to a great extent affecting Douglas fir.

Mr. R. D. Prettie, superintendent of forestry of the Canadian Pacific Railway, stated that that company was one of the largest users of lumber in the country, and its policy was to purchase Canadian product. He claimed that railways had been blamed for very many fires with the starting of which they had nothing to do. If the farmers, lumbermen, ranchmen, fishermen and others were educated in the same way the railways had been educated, some results would be secured. The company had secret service men out, and would trace up every fire that occurred. Mr. Prettie asserted that a number of saw-mills were not observing the law in regard to the burning of refuse in an enclosed burner, and produced photographs showing open fires burning, some in the vicinity of green timber. He assured the government and people of British Columbia that the C. P. R. desired to co-operate in the development of the province's resources along lines that would be in the best interests of all.

Mr. E. J. Palmer and Mr. R. H. Alexander told the visitors from across the line how the British Columbia saw-mills have succeeded in introducing odd lengths, having convinced architects, builders and owners that odd lengths were as useful in building as even lengths.

Mr. W. C. Gladwin, Supervisor of Fire Wardens, informed Mr. Prettie that one of the most destructive fires in the province, costing seven lives and millions of dollars in property, was the result of negligence of C. P. R. employees in not putting out a fire which started at New Denver, in the Slokan district, two years ago.

Mr. Aubrey White told the convention that in Ontario timber was now sold by competitive bids per thousand feet, and that in paying \$8 to \$10 per thousand the lumbermen were taking more interest in timber preservation than any other persons. The government had also placed the responsibility of selecting fire forests

on the lumbermen themselves and had done everything possible to prevent the appointments from being political.

Friday Afternoon, Sept. 6.

The first address of the afternoon was by Mr. E. T. Allen, founder of the Western Forestry and Conservation Association, of Portland, Ore. U. S. A., on 'Methods of Forestry Campaigning.' Mr. Allen showed that the great aim was to get every man, woman and child to realize the situation as to the forests—that they should be preserved, and could be. The general plan was to gain the good-will of the people—not to threaten them, but to tell in short, pithy sentences what damage a forest fire does and to ask them to prevent it. Placards were put up, showing a burnt forest, with this legend: 'Burnt timber pays no wages.' On the other hand, on the back of lumber company signs were sentences like this: 'This money comes from the forests; help to preserve them.' Going on, Mr. Allen showed how they dealt with school children, the legislatures, the women's clubs, the boards of trade and all other bodies that could be reached. Mr. Allen's address was a revelation to those present of how to arouse public attention.

Dr. Judson F. Clark, of Vancouver, read a paper on 'The Financial Value of Forests to British Columbia.' He showed the difficulty of putting a financial value on some of the advantages of the forests, such as an improved climate and the opportunity for rest and recreation for the towns which forests provided. He estimated the present use of lumber in British Columbia at a little over a billion feet, board measure, and said that if the forests were properly cared for, they could produce four or five or possibly six billion board feet, which would mean forty million dollars spent in taxes in the province, besides a great increase in the provincial revenue. This was outside of the benefits improved forestry methods would bring in providing a supply of fuel, feeding and power and in regulating stream-flow, as to the possibility of increased use of wood he doubted that because more wood products were being used today than ever before, even in shipbuilding. He closed with a reference to the value of the forest regions to lumber companies in limiting their limits.

Mr. S. M. Campbell, Dominion Director of Forestry, reviewed the forestry situation throughout Canada. He showed the state of the forests in all the provinces from New South-westward and to the Dominion government areas in the three prairie provinces. He pointed out the mistakes that had been made. The for-

ests of Canada might last indefinitely if the fire-fiend were conquered, but this was not being done in any province. It seemed likely that timber revenues would diminish from this onward and nothing was being done to secure reproduction. The fire-ranging systems, while extensive in some provinces, needed the adoption of a definite policy in order to get results.

'To sum up, in the eastern and prairie provinces, the supply of timber is decreasing without adequate means being taken to replace it; the Government revenues from timber are declining and, therefore, the ability to take proper means for saving the forest is decreasing, as the necessity increases. When these provinces awake to the need, they may find the financial strain too great. The Dominion Government while handling well the forests in its own jurisdiction, might fairly be asked to come to the help of the provinces, for forest assets are assets of the whole country as well as of the provinces. British Columbia is in the unique position of having large areas of fine timber and also a buoyant revenue. It is, therefore, in a more favorable position than any other province to inaugurate a good forest policy and it is a satisfaction to all citizens of the Dominion to know this is being undertaken in an adequate manner. The good features of the system being organized are the following: —

1. Advantage has been taken of expert knowledge in the laying out of policy and organization.

2. The staff is being placed on a civil service basis so that appointments will be made on considerations of merit.

3. A strong head-quarters staff has been provided.

4. Provision has been made for investigating the conditions affecting the forests and the timber industry.

5. This organization will administer all matters relating to the forests and timber, and not, as in other cases, separate timber administration from forest conservation.

Mr. H. K. Robinson, Assistant Forester of British Columbia in charge of forest surveys, pointed out the enormous work of securing data regarding the forests on an area 700 miles long and 400 miles wide which comprised British Columbia, and making timber maps of the same area. To do this as rapidly as possible, a number of parties were being sent out and ten were now in the field. The forest service of British Columbia was only three months old, but no time was being wasted and they were confident of completing the reconnaissance survey by 1915.

Mr. W. H. Breithaupt, C. E., of Berlin, Ont., read a brief paper, illustrated by diagrams, on 'A Lost Opportunity in For-

est Conservation.' The opportunity was in the western peninsula of Ontario. Here was a district with a rainfall of about thirty three inches with forests and swamps to retard the run-off and keep the rivers, in equable flow. It has been stripped, with the result that, while there has been no appreciable change in precipitation, the fluctuation of the streams has become so great as to destroy their use for power purposes. He instanced a case coming under his own observation in the Grand River, (Western Ontario) where the flood flow was 20,000 cubic feet per second, and the minimum summer flow forty cubic feet per second. He asked whether the destroying of rivers and forests had been paid for by turning all into cleared land when much of it was third and fourth quality agricultural land and some of it entirely useless.

Resolutions.

The Resolutions Committee reported through Mr. Aubrey White, and, after some discussion, the report was adopted as follows:

- (1) Resolved, that the Canadian Forestry Association endorses the suggestions submitted by the British Columbia Lumber and Shingle Manufacturers' Association in favor of the establishment of a course in logging engineering in the new British Columbia University.

- (2) Believing that actual working co-operation between public and private forest management is essential to mutual understanding and complete success, we urge upon Canadian lumbermen the study and emulation of the lumber-owner's co-operative fire associations of the Pacific Northwestern States which are proving of great value, not only in their own fire control but also in bringing about closer and better relations between all agencies engaged in forest preservation.

- (3) Whereas, the proper disposal of debris resulting from lumbering operation is essential to the effective protection of forests from fire, therefore resolved, that the association urges upon the Dominion and Provincial Governments, the advisability, as soon as practicable, of adopting measures to this end.

- (4) Resolved, that the Canadian Forestry Association is of opinion that it is in the public interest that squatting or settlement should not be allowed on lands that are chiefly valuable for their timber, and that all non-agricultural lands should be reserved permanently for timber production.

- (5) Resolved, that the convention of the Canadian Forestry Association desires to call attention to resolution No. 3, passed at the last convention of the Associa-

tion and again expresses the opinion that it is important that all appointments in the forest service of the Dominion and Provincial Governments should be based on capability and experience.*

(6) Resolved, that the Canadian Forestry Association would recommend that the fire acts of the Provinces of Manitoba, Saskatchewan and Alberta, which were enacted some years ago, be revised so as to provide more efficiently for the prevention of fire and the punishment of offenders.

(7) Resolved, that, recognizing our common bond and common aims, we desire to testify to the achievements and practical assistance to the forestry cause of the American Forestry Association and hope for increasing co-operation between our organizations.

(8) Resolved, that this Association congratulate the Government of British Columbia upon the excellent beginning it has made in the task of protecting the forests of the Province and is of opinion that the force employed should be largely increased, that there should be increased expenditure not only upon patrol but also upon permanent improvements, such as the construction of trails, telephones and lookout stations, all of which will tend to make forest preservation more efficient.

(9) Resolved, that this convention endorses the action of the Dominion Government in setting aside forest reserves, that it urges further reservation of suitable areas and the retention of existing reserves in their entirety with the object of affording to the surrounding districts the best results for all time in regard to fuel and timber supply, grazing, the protection of game and regularity of stream flow.

(10) Resolved, that the thanks of the convention be, and are hereby, tendered

those gentlemen from the United States who assisted by their presence and by their papers in the work of the convention.

(11) Resolved, that this convention desires to place on record its appreciation of the kindness of the Friends, Sir Rickard McBride, and the members of the Executive Council, especially Hon. W. R. Ross, for the many kindnesses and abundant hospitality shown the delegates at this meeting.

(12) Resolved, that the thanks of this convention be tendered to His Honor, the Lieutenant Governor, for hospitality shown the convention in the garden party given them at Government House.

(13) Resolved, that this convention desires to express its appreciation of the action of the businessmen and citizens of British Columbia in tendering them the magnificent banquet which was the social feature of this convention.

(14) Resolved, that this convention desires to express its warm appreciation of the kindness of Mr. A. C. Hamerlett, chairman of the local committee of arrangements, who, in a brief period of the year, gave up important engagements and spared neither time nor pains in order to do whatever was necessary to make the convention a success.

(15) Resolved, that the railways of Canada, and particularly the Canadian Pacific Railway, be thanked for their kindness in granting special rates which made possible the attendance of so many delegates from Eastern Canada.

(16) Resolved, that the thanks of this convention be tendered the people of Canada for its ever-ready support through its aid in the cause of forest conservation, both during this convention and throughout the year.

Friday Evening.

The convention concluded with a meeting in Alexandra Hall, where there was brief address and an illustrated lecture. The meeting was well attended and the audience most appreciative.

Dr. H. E. Fernow, dean of the faculty of forestry of the University of Toronto, gave some reminiscences of the early days of the movement. When he first visited in New York and said he was a Forester, the people did not know what that was, he said. Forestry was not even in the dictionary, so far as the American people were concerned. But not until the arrival of another Canadian forester, one of the great Vancouver brothers, was an improving possible. As the result of a call of this gentleman to the city of Cincinnati a movement was started in that city and this culminated in the holding of the first forestry congress ever held in the country. That led to the

*Resolution No. 3 passed at the Ottawa Convention (Feb. 7 and 8, 1917) was as follows:

(3) Whereas, efficiency in the administration of the forests of Canada, which are one of the greatest of the national assets, can be obtained only by adopting a permanent policy carried out by a staff appointed on the grounds of special fitness for the positions which they are to fill, and removable only on grounds of inefficiency,

Therefore Resolved, that this association urges on the federal and provincial governments the necessity of providing a system of examinations to test the qualifications of appointees and of making appointments permanent during good behavior, and that in the case of the federal government for this purpose appointments should be placed in the hands of the Civil Service Commission.

in April, 1882, and among those present were three delegates representing the Canadian government, two of whom are still alive. The convention was actually the best ever held, successful as succeeding ones have been. A second convention was held in Montreal the same year, and Sir Henri Joly de Lotbiniere was the first president. This convention passed off with as much aplomb as the one in Cincinnati, and from that time the fortunes of the international association which was known as the American Forestry Association, were unquestioned. In 1900 the Canadian Forestry Association was formed and its progress had been rapid and its influence immense.

'There is an antagonism between the forester and the lumberman,' said Dr. Fernow in conclusion. 'It is an antagonism that will never die, that can never die. The lumberman is the harvester and, like the harvesters whom the railways bring into the west at this season of the year, he is no more a forester than they are farmers. The forester is the farmer who is cultivating a crop and the lumberman is the harvester who is gathering it in.'

CANADA'S FOREST RESOURCES REVIEWED.

Mr. James White, secretary of the Commission of Conservation of Canada, warned the lumbermen as well as the public that the timber resources of the Dominion were not illimitable. No more dangerous idea, no more ruinous conception, could be entertained, he said. Instead of the forests of the Dominion being unlimited, they were absolutely the very reverse. One idea was that they were greater than those of the United States. They never were on a level with the latter. The forest resources of Nova Scotia, at the present milling capacity, were only enough for twenty years. In New Brunswick there were no definite figures, but no doubt between the cut made by the lumbermen and the devastation of fire their forest resources must be tremendously depleted.

To-day Quebec had no pine that was not in private hands. There were large areas of spruce, which would be of great value, but it was not the sort of timber that could be shipped southwards. In Ontario the estimate of the white and red pine that was still the property of the crown was ten or twelve billion feet, and if the present milling capacity was kept up it would not last more than twelve to fifteen years. Westward, in the territory of Keewatin, while there were large areas of spruce, there was nothing comparable to the great forests which formerly covered the whole of southern Ontario. In the great virgin forests which he had seen a quarter of a century ago in the Rockies there had been enormous devastation by fire.

In British Columbia there were vast forests, but the word illimitable was not applicable to them. Douglas fir was the most valuable tree, but a glance at the northern boundary of its growth showed that it was not unlimited. The other immense areas did not contain anything like the illimitable quantity popular fancy attributed to them. Mr. White said one of the features of the day was the endeavor to get at the truth in such matters, and this was part of the work the Commission of Conservation was trying to accomplish. The commission was getting as detailed and accurate a report as possible of what Canada had, and proposed to tell the truth as it found it.

Mr. R. H. Campbell, Dominion Director of Forestry, as a past secretary, commended the work of the present one. Taking up Dr. Fernow's story of early times he reminded his auditors of the work of William Little of Montreal in 1882 and onward, and of Mr. E. Stewart in starting the movement for the Canadian Forestry Association in 1899. He traced its growth until the present and saw a great field of usefulness before the Association.

THE VALUE OF B.C. FORESTS.

Mr. H. R. MacMillan gave a very interesting account of the formation of the provincial forest service in a manner which appealed to the general public. He reminded British Columbians that in their forests they had an asset, which thus early in the development of the service was yielding an annual revenue of \$2,600,000. As indicative of the small size of the logs with which the Eastern lumberman now has to be content, Mr. MacMillan mentioned that there are to-day in British Columbia dozens of Eastern lumberjacks who have come out here because there are no longer logs large enough in the woods to carry them in the rivers. Between Lake Winnipeg and the Rocky mountains there was no lumber beyond a small local supply, and it was certain that there would be developed in the prairies an enormous market for the forest products of this province. He believed that the tremendous extension of the lumber industry would not reach its limit until at least \$100,000,000 was brought in annually by the sale of forest products for distribution among the people of the province.

The chief forester explained very graphically the effect of denudation of hillsides on the storage of water and the maintenance of the flow of the rivers and streams, upon which depended the utilization of the water-powers, of which this province had so many. In the pictures which were thrown on the screen afterwards, the result which has followed the destruction of forests in portions of the States, in France and in other countries, was brought home. In concluding

his address, Mr. MacMillan said:

'As the Dominion chief forester pointed out to-day, the honor of organizing the first fully equipped forest policy in Canada belongs to the Province of British Columbia. It was Dr. Fernow who first planted the seed of forestry on this continent; it was Gifford Pinchot who first showed the men of western America that forestry did not mean the locking up of their natural resources, but meant their fullest, wisest development; it was Sir Richard McBride whose prophetic instinct saw that the whole future commercial life of this province depended upon the general policy adopted by his government; it is Hon. W. R. Ross who is giving to the details of the shaping and administration of that policy a degree of personal attention which forestry has never before received from any cabinet minister in Canada.'

CONCLUDING WORDS.

Hon. Mr. Ross, being asked by the president, Mr. John Hendry, to say a few words before the convention adjourned, expressed his appreciation of the many kind things said about the forest service of the province and of the testimony borne to the ability of the men whom the government had selected to carry on the work. The chief forester was a thorough enthusiast, and was preaching a gospel of conservation in such a way as to make it understood by the taxpayer. Mr. Ross said he was certain that the work the government had undertaken would become popular with the people of British Columbia.

A vote of thanks to Mr. Hendry, moved by Mr. J. R. White, seconded by Mr. R. H. Campbell, was passed, and responded to by that gentleman, who took occasion to voice the thanks of the members of the association to the people of Victoria for the welcome accorded them.

THOSE PRESENT.

Alphabetical List of those attending the Victoria Forestry Convention, Sept. 4-6, 1912:—

- Adair, Edward, Manager Adair Mining Co. 1145 Semlin Drive, Vancouver.
 Alexander, Byron C. 1170 Pender St. W., Vancouver.
 Alexander, Richard H., Asst. General Manager, B. C. Mills P & T Co., Vancouver.
 Alexander, R. H. H., Manager B. C. Lumber & Shingle Mfg. Assn., Ltd., Vancouver.
 Allard, Hon. Jules, Minister of Lands and Forests, Quebec, P. Q.
 Allen, A. E., 229 Government St., Victoria, and Mrs. Allen.
 Allen, E. T., Forester, Western Forestry & Conservation Assn., Portland, Ore., and Mrs. Allen.
 Allen, Robert H., Editor, Pacific-London Trade Journal, Seattle, Wash.
 Anderson, Ald. G. W., 311 Kings Road, Victoria, B. C.
 Anderson, Harry, 1500 Main, Victoria.
 Anderson, Jas. S., Ex-Deputy Minister of Agriculture, Victoria.
 Andrew, Edna C., Campbellton, N. B.
 Atherton, John, John Atherton Limited, The Victoria and Westport.
 Atchaf, E. G. B., University of Toronto, Toronto, Ont.
 Atkey, H. H., Harris, Ont.
 Austin, J. R., Seattle, Wash., Officer of the United Lumbermen, Chicago.
 Ayton, Wm., 1445 Denison St., Victoria.
 Baird, W. W., Editor Times, Victoria.
 Bannock, E. C. B., 1204 Westminster St., Victoria, B. C.
 Baker, Ald. J. H., 1411 Commercial Road, New York.
 Baily, Dr. Walter, 313 Esplanade, Victoria.
 Bailey, G., Vancouver.
 Bailey, S. W., Times Weekly, Victoria.
 Barker, Fred C., Seattle, Ont.
 Barnard, G. H., M. P., Victoria.
 Barnett, Jas., Vancouver.
 Barr, Mrs. E. R., 914 Mulgrave St., Victoria.
 Barrett, H. E., 840 E. 4th St., Victoria.
 Barrett, E. W., Crown Timber Agent, New Westminster, B. C.
 Beckett, The Wharf, J. C., Mayor of Victoria.
 Beckett, P. A., Sales Manager B. C. Mills P & T Co., Vancouver.
 Bell, C., 101 1/2 St. W., Lethbridge and Mrs. Bell.
 Bennett, H., M. P., Victoria.
 Benoit, J. P., 1116 Clatsop Ave., Victoria.
 Best, Sam., 1016 Union Ave., Victoria.
 Bewdley, H. E., Asst. Forester & Chief of Fire Protection Branch, Victoria, B. C.
 Birk, May Ann, Toronto.
 Bird, F. C., ALBERTA, Western Canada Press Co., Vancouver.
 Blackie, C. E., Manager O. A. Mowat Limited Co., Campbellton, N. B.
 Blackie, A. D., Representative Board of Trade, Lethbridge, Alta.
 Blackie, J. H., Blackie Stewart & Welch, Ltd., Vancouver and Seattle.
 Blair, H., 1007 Quinlan St., Victoria.
 Blanton, Hon. Henry, Assistant, Monte Creek, B. C.
 Bodwell, J. A., Gen. Manager, Breakers Pulp & Lumber Co., Esau, Angus, Que.
 Bonham, Mrs. Lillian M., Premier's Office, Victoria.
 Boyd, E. M., West Kelowna, Ont.
 Boyd, W. T. C., Bannockburn, Ont.
 Brinkley, W. H., C. E., British Columbia Forest and Mill Industries.
 Brown, F. C., Hon. Chairman, Board of Trade, 14 Ferguson Court, Vancouver.
 Brown, Geo. W., Canadian Forest Board, London, Co., Ontario.
 Buchan, Frank, Manager Bank of Hamilton, Vancouver.
 Bullock, F. L., Manager British Columbia Lumber Co., Vancouver.
 Burgess, J. C., Esquimalt, B. C., Victoria.
 Burns, Horan A., Graham Island, B. C., and Mrs. Burns.
 Cameron, D. Roy, Insurance Company, Seattle, Washington.
 Campbell, A. A., 1101-1103, B. C., Victoria.
 Campbell, Hon. Chas. H., Minister of Public Works of Manitoba and Mrs. Campbell.
 Campbell, Frank, 1116 Pender St., Vancouver.
 Campbell, J. H., Manager, Victoria Bank, Vancouver.
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 Campbell, Roy A., Berkeley, Mass.
 Cameron, J. W., Fairbank Road, Vancouver.

- Carson, Rev. Hermon A., Y.M.C.A., Victoria.
 Carson, P. A., Dept. Interior, Ottawa, Ont.
 Challies, J. B., Interior Dept., Ottawa, Ont.
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 Charleson, Alex., New Westminster, B.C.
 Charlton, Hon. W. A., M.P., Toronto, Ont., and Mrs. Charlton and the Misses Elsie and Ethel Charlton.
 Christie, A. E., Manager Union Bank, Victoria.
 Clark, H. Maxwell, Canadian Highway Association.
 Clark, Dr. Judson F., of Clark & Lyford, 1164 Pacific St., Vancouver.
 Cleveland, E. A., P.L.S., Vancouver.
 Coburn, John W., Nanaimo, B.C.
 Cook, Rev. Gilbert, Cook St., Victoria.
 Cornwall, Geo. M., Editor The Timberman and Secretary Pacific Logging Congress, Portland, Ore.
 Craig, Roland D., F. E., Dominion Lumber & Timber Co., Vancouver.
 Crawford, F. L., Manager Canadian Bank of Commerce, Victoria.
 Cronk, C. P., Rep. James D. Lacey & Co., Portland, Ore., and Port Haney, B.C.
 Cunningham, P. J., Nelson, B.C., and Mrs. Cunningham.
 Cuthbert, Ald. Herbert, Victoria.
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 Davey, L., Blanchard St., Victoria.
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 Dawson, G. H., Surveyor General of B. C., Victoria.
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 Delaney, Dr. William, Asst. Supt. Woods and Forests for Quebec.
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 Dewdney, Hon. Edgar, Victoria, and Mrs. Dewdney.
 Dickson, J. R., Dominion Forestry Branch, Edson, Alta.
 Dier, R. B., Mayor of Ladysmith, B.C.
 Dilworth, Ald. John, Victoria.
 Doig, D., Manager Bank of B. N. A., Victoria.
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 Ellis, L. M., Forest Inspector C.P.R., Calgary, Alta.
 Ellison, Hon. Price, Minister of Finance and Agriculture, Victoria.
 Elworthy, F., Secretary Board of Trade, Victoria.
 Estlin, Alfred B., Melita, Man.
 Evans, J. M., Dept. of Natural Resources, C.P.R., Lethbridge, Alta.
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 Flemming, Hon. J. K., Premier and Surveyor-General of New Brunswick, Fredericton, N.B.
 Flumerfelt, A. C., President, British America Trust Co., Chairman B. C. Commission on Forestry, Victoria.
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Leason, F. W., Vancouver.
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Levenson, Ernest D., Vancouver, Cdn. Vancouver.
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neters, Vancouver.
McFarr, W. H., Engineer, Plans Ore.
Mastars, Mrs. D. M., Vancouver, and Mrs.
Clark, Macdonald.
McGee, Emma, Secretary, Vancouver Social
Development League, Victoria.
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McKay, G. H., Vancouver.
McKay, Neil, Victoria, B.C., B.C.
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McNair, Frank, The Province, Vancouver.
McNair, A. H., Vancouver.
McNair, H. C., Main, Man.
McNair, William, and General Manager, Western
Copper Co., Ltd., Vancouver.
McPherson, H. A., E. Victoria.
Mason, S., Gov. of the Province, Ottawa.
Mason, Prof. John, Asst. Director Geological
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FIRE-RANGING SUGGESTIONS.

An Alberta clergyman, writing not long ago to the Secretary, expressed himself as follows:—

'I have grieved very often over the dreadful destruction of timber that we see on every hand. Then we have suffered so severely with fire from year to year in the Crow's Nest Pass, that I am very glad to be brought into touch with the Association.

'I have long felt that one of the first steps that the Dominion Government should take is to compel all loggers to burn their slash. This would make fire-fighting a very much more simple thing than it is now. It would work no hardship on the lumberman, as all would fare alike, and the increased cost would be borne by the public in the end.

'Again, from our experience this summer here, I feel that no fire-ranger should be appointed who has to defend property of some one who is heavily interested in only one section of the country, and who, receiving his pay in part from such a person, will naturally give himself to the care of his employer's timber to a greater extent than he otherwise would do if he were paid entirely by the government and under obligation to do his very best for the whole community.

'Again, such men should be appointed not for one or two months of the year, but for the whole summer. He should know very thoroughly the district in which he is located, be familiar with every point of vantage where a fire could be easily checked, be under obligation to prepare rough maps of the trails and creeks and ridges where fires can be most easily stopped.

'Further such fire-rangers should have the power to order out any man to assist to put out a fire.

'I am sure that if active, earnest men could be got for this work many millions of feet of timber would annually be saved to the country.'

Much of what is above advocated is precisely what the Forestry Branch is endeavoring to carry out, not only in the Rockies, but on all other forests under its jurisdiction.

FORESTRY IN KOREA.

The most visible misfortune of Korea is the loss of her forests, says President Starr Jordan, of Stanford University, writing in the *American Review of Reviews*. Except along the Yalu River in the north, where still remain the pine forests which the Russian promoters had taken, Korea is practically a treeless land.

Originally the forests were destroyed to get rid of tigers and leopards. Now every young tree or bush that springs up is taken for firewood. The people burn weeds and hay, and suffer greatly in the winter time. Good cattle are raised in Korea, being used mainly as beasts of burden, never for milk.

The chance comes, joined by fortitude. A complete and careful forestry map of Korea has been completed and every method known to forestry for bringing back the trees is in use.

Lt. Col. T. R. McInnes, a member of the Ontario Legislative Assembly for North Norfolk, is a strong advocate of reforestation in Southern Ontario. In one of the debates during the session just passed, he discussed the situation. He argued that the province was not giving nearly enough money for this work of reforestation. He thought there should be three hundred or four hundred acres of waste land reforested each year. He also criticized what he called the "cut-and-club" policy followed by north



(Vancouver, B.C.)

The Heart of the Down-town District and Waterfront, Vancouver.

but the people cannot afford to keep them as they need all their hay to burn.

The loss of timber causes great waste of land by wash of the hills. One hundred and seventy thousand acres of land are taken to the sea every year. The wash of the land destroys the breeding grounds of herring.

The Japanese have taken the task of reforestation very seriously. O. Saito, the head forester, has in experimental cultivation nearly all the trees of value in temperate regions. This year three million new trees were planted. Certain privileges are granted to farmers who rear the trees which are given them, while the destruction of the H. period.

Ontario. He said all the land should be carefully examined, and where it is not suitable for farming it should be sold for a permanent timber reserve. He thought they be cut on such a plan that the young forest would have a good chance for rapid growth over the area. In this way the north country could be reforested at practically no expense.

During the seven years from 1901 to 1908 inclusive the United States imported 176,780 tons of wood pulp from Canada. This was 70.5 per cent. of the total wood pulp imports of that country, and that

OTIS STAPLES.

A sad circumstance in connection with the Convention at Victoria was the absence therefrom of one who otherwise would have been one of its most enthusiastic and active participants, Mr. Otis Staples, of Wycliffe, B.C., whose untimely and sudden death early in August deeply affected the lumbering community. Mr. Staples was fishing about twenty miles from home, when in casting the fly the hook caught in his left eye. The hook baffled Mr. Staples' efforts to extricate it, and as no one else in his party was able to run his motor car he was forced to drive the car home while suffering excruciating agony. He was then hurried to Cranbrook, where the hook was extracted. He was sent to Spokane Hospital, but in spite of everything that could be done, died after a week's suffering. His remains were taken for interment to Stillwater, Minn., his old home.

Mr. Staples was a native of New Brunswick, where his successful career is regarded with great pride. Starting out to seek his fortune in the lumber business, he went first to Michigan and then to Minnesota, where he spent the greater part of his working life, building up an immense business and becoming one of the leading lumbermen of the state. With the decrease of the timber in Minnesota he acquired interests in the Pacific coast states and later in British Columbia, where he made his home at a village which he created and named Wycliffe. Mr. Staples, who leaves a grown-up family to carry on his work, was keenly interested in all lumbermen's organizations, and his loss will be felt on both sides of the international boundary.

As showing a growing interest in forestry it may be noted that at a recent meeting of the Woman's Institute at Embro, Ont., Miss Effie Ross read a paper written by Mr. James G. Ross, C.E., of Montreal, showing the present status of forestry in Canada, and urging that greatly increased work for taking care of our forests be inaugurated by both provincial and dominion governments. The paper was published at length in the *Embro Courier*.

During 1911 the nurseries of the Pennsylvania Forestry Department produced approximately 2,000,000 seedlings. With the exception of 50,000 seedlings which were furnished to private individuals all these were planted on state reserves. In the same period the state provided 32,713 acres of land which were added to the state reserves. The department of the work having to do with campers and others securing health and recreation in the state forest reserves is rapidly increasing. According to the permits issued it is estimated that at least 10,000 people spent vacations on the reserves. This is an increase of about 2,500 over last year.

I have seen many places in Indiana where great damage will result to the future unless an enlightened system of forestry is employed. We owe it to ourselves, and particularly to those who shall come after us, to do our share to preserve all of the valuable resources of the state. We owe it to the state itself to make good the waste places and preserve her natural wealth, subject to our reasonable needs, for future generations. — Former (U.S.) Vice-President Fairbanks.

Dr. Stanley Mackenzie, Principal of Dalhousie College, Halifax, in lecturing before the Canadian Club in Ottawa, made a strong plea for a government laboratory to conduct exhaustive experiments in regard to the properties of the various Canadian woods to discover how they could be used to the greatest advantage. This laboratory would also conduct experiments to find the best methods of preserving woods. In this way a much wider range of usefulness would be given these woods, and many of the inferior kinds would be so improved by preservatives that they could be used for railway ties, fence posts, telegraph poles and cross-arms, and the life of the timbers in these exposed situations would be greater than that of the better timbers not so treated.

New York has added another nursery to its list of State forest activities. It has put under cultivation at Geysers, some two miles from Saratoga Springs, about six acres in charge of F. A. Gaylord, with M. D. Steele as local superintendent. Of the 1,400,000 seedlings transplanted, 1,100,000 were white pine, 250,000 Scotch pine, and 50,000 tamarack.

With the Forest Engineers.

IN THE B.C. FOREST SERVICE.

The Government of British Columbia has secured the services of nineteen foresters for the new Forest Branch of the Lands Department. The following is a statement of the present personnel and organization of the force:

Consulting Forester, Overton W. Price.

Chief Forester, H. R. MacMillan.

Chief of Records, M. A. Grainger, who has charge of the clerical staff and all office work.

Chief of Operation, R. E. Benedict, who controls the fire preventive force of the province, consisting of two Supervisors, nineteen Divisional Fire Wardens, and upwards of 140 District Fire Wardens, besides patrol men. He is also charged with the general field organisation.

Chief of Management, J. Lafon, who has under him the force of timber inspectors and government sealers, and attends to the commercial side of the forest business.

Chief of Forest Surveys, H. K. Robinson, who is in charge of the reconnaissance work.

Forest Assistants employed on special reports and investigations of lapsed leases, etc., under Mr. Lafon, are Messrs. Beard on the coast, and Prince in the interior.

There are employed on preliminary reconnaissance:—

G. H. Edgecombe, on the Upper Fraser with headquarters at Tete Jaune Cache. He is to do the work of a timber inspector and issue permits for timber for railway construction in addition to his other work.

H. C. Kinghorn, on the Upper Fraser at Fort George, and P. Z. Caverhill, at Hazelton, have the same work as Mr. Edgecombe.

The following are out for reconnaissance, but are available for any

special reports that may be required in their territory:—

J. B. Mitchell in the Omineca country, Fort St. James.

H. S. Irwin, Adams River, Kamloops.

T. H. Plummer, Okanagan, East Vernon.

L. S. Higgs, Vancouver Island, North.

The following have been engaged but have not yet taken up their duties: Messrs. McDougall, Mumford, Garsent and Ingall. They will probably be detailed for reconnaissance.

In the absence of a systematic survey of the Province, and in view of the fact that very little is known about most of British Columbia, and that the little that is known is not available for reference anywhere, it has been decided to make a systematic reconnaissance of the province from a forest point of view. To do this in detail would require many years of work, and an enormous staff, and would give results such as are not at present required. What is required now is a fairly correct map, showing where the timber is and what it is like and where the roads, trails, lakes and rivers are and what they may be used for. In addition the reconnaissance officers have to take special note of land suitable for agriculture and to send in special reports of such areas for the information of the Minister of Lands.

The foresters in British Columbia had a very successful luncheon on the Saturday following the late Forestry Association convention. Mr. MacMillan, Chief Forester, writes enthusiastically of the gathering as follows:

We had a very good meeting of the Society of Forest Engineers here (Victoria). There were twenty-four foresters at the convention, and eighteen at the luncheon which we had on

Saturday noon. The luncheon was the best meeting that I have attended yet. It was not a business meeting in any way, but just a gathering together to get better acquainted.

NEW ZEALAND REFORESTING.

Persons who have recently visited New Zealand speak in warm terms of the success of tree planting on that island. The authorities have discovered that at the present rate of cutting the New Zealand forests will not last for more than thirty-five years, even if none of the standing timber is destroyed by fire. They have, therefore, begun the work of planting barren areas. Most of the districts now being planted are a very difficult field because they consist of the slopes of volcanic mountains from which all the vegetation was swept by an earthquake and volcanic eruption about twenty five years ago. This has left the hillsides covered with a deposit of ashes, underneath which is a stiff clay, too stiff to be swept away by the torrents of water from the upland lakes, which at the time of the eruption boiled over and eroded the hills. It was felt that the native trees would not live in this upland, but good success was met with in planting imported larch, and of these about 3,500,000 trees per year are being planted. The planting is being done by prisoners of the better class, that is to say, first offenders and men who can be, in a measure, put on parole. The officers over them carry no firearms. Every man is allowed eight credit marks per day for good work, and these credit marks go to shorten his term in prison. At the end of their prison term the prisoners may remain at planting work, and for this they receive two dollars per day. In this way many are enabled to earn sufficient to give them a new start in life. Up to the present New Zealand has spent \$930,000 in this work, and it is expected that within twenty years when the second thinnings are begun they will have a very considerable revenue from the poles taken out which will be used for railway ties, mine props and fence posts. The experiment is considered a success from the standpoint of both forestry and prison reform.

TREES ON HOMESTEAD.

On the average homestead of a quarter section does it pay to plant trees for wind-break? If so from what standpoint?—M. R. K.

Ans.—Yes, it pays any man who settles on the open prairie to plant trees as soon as possible. It pays in the matter of shel-

ter from storms, making the home more easily heated and the stock more easily kept; it pays in avoiding excessive loss of moisture from the fields incident to a straight sweep of the wind; it pays in affording shelter for stock from the hot sun. Such reasons can be given in any number. But chief of all from the money standpoint is the increase in value of the quarter section. If an anxious purchaser were to go to your locality he would pay considerably more for a farm on which stood a house and outbuildings surrounded by fine shelter belts than he would for similar land with similar buildings but lacking the trees. Then, do not forget the general satisfaction of a fine house among trees.—*Farmers' Advocate (Winnipeg.)*

So serious has the chestnut blight become in the United States that there has recently been held in Harrisburg, Pa., at the call of the Governor of that state, a conference of representatives of the different state organizations to discuss ways and means of dealing with this danger. The blight upon chestnut trees was first noticed near New York City. It has now spread till chestnut trees are affected in New York, Pennsylvania, New Jersey, Delaware, Maryland, Virginia, West Virginia, Connecticut, Rhode Island and Massachusetts. It is estimated that it has already caused a loss of \$50,000,000. The damage is caused by fungi which work in the inner bark. The damaged area soon forms a ring about the tree and stops the flow of sap and causes death. The result of the Harrisburg Conference was a call to the governments, state and federal, of the United States and Canada to undertake a vigorous crusade against the blight. Already a number of the officers of various governments are searching for means to destroy this fungus growth and save the trees.

The *American Lumberman*, in pointing out the great need of education on the subject of conservation instances a case in the little town in the State of Washington in a district that had suffered somewhat from forest fires. A merchant of the town expressed to the representative of the newspaper in question the wish that the entire district should burn over, his view being that mills would have to be erected to cut the burnt timber as quickly as possible to save it from insects, and thus the prosperity of the town would be immediately increased. Washington is not the only part of the world where this erroneous idea prevails, but this instance emphasizes the need of educating the general public on this subject as rapidly as possible.

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Engelmann Spruce in Crow's Nest Valley, Alta.

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Fixing the Value of Shade Trees.

The Appellate Division of the New York Supreme Court has confirmed a judgment of the lower court, fixing what may be called a good round value on trees in the city.

A construction company doing some work on a street found that the trees hindered their progress. They thereupon cut down the trees without so much as considering for one moment their value to the owner's property.

Suit was at once brought against the company, the damages being laid at \$500 for each tree cut down. The plaintiff recovered for the full amount as the value of the trees, and the court added \$1,000 more for punitive damages. It was this verdict which was carried to the Appellate Court and has been sustained.

Five hundred dollars may seem a large sum for a tree in the city, but it must be remembered that the value of the tree as kindling wood or as lumber, or even as the material for house-trim or furniture, is not the thing to be considered. The tree required many years to grow. It not only adorned the property, but it afforded health, comfort, enjoyment and protection to its owners. Its place, when destroyed, could not be filled by another tree inside of fifteen, twenty or thirty years, and all this time the

Extends a cordial invitation to those interested in the forests of this country, from whatever point of view, to join its ranks, and help to spread knowledge of, and interest in, the forests of Canada in particular, and in general of the world. During the past few years the interest in the proper use and the protection and perpetuation of the forests has greatly increased, and to this increased knowledge and interest the Canadian Forestry Association, by its propaganda work, has contributed its share. Founded in 1900, with a membership of 12, it has in twelve years increased its membership to 2,700. During these years it has held conventions throughout Canada from coast to coast, in the Ancient Capital and in the bustling cities of the prairies and Pacific coast, in the manufacturing east and the agricultural prairie country. Its official organ, *The Canadian Forestry Journal*, was started in 1905 and is now in its seventh volume. But as forestry goes on, circumstances change and new needs spring up, and the Association is anxious to do its duty in arousing public interest and pointing out ways of getting things done. One object of the Association was achieved when forest reserves were established; but that is merely a beginning and now proper administration of these reserves, on the basis of the public good, irrespective of any private or partizan interest, must be secured. When that is done other problems will present themselves for settlement. The Association wants the interest and enthusiasm and, in some degree, the contributions of the public. The annual membership fee is \$1.00; this entitles the member to *The Canadian Forestry Journal* for a year, the annual report of the society, and other literature. Life membership costs \$10.00. Applications for membership should be addressed to James Lawler, Secretary, Canadian Forestry Assn., Canadian Building, Ottawa.

owners of the property are deprived of its benefits.

When the courts take all these facts into consideration and assess construction companies \$500 for each large tree wilfully destroyed by them, trees will be safer and the work of shade tree commissions will be better protected and more highly respected.

—Newark (N.J.) Evening News.

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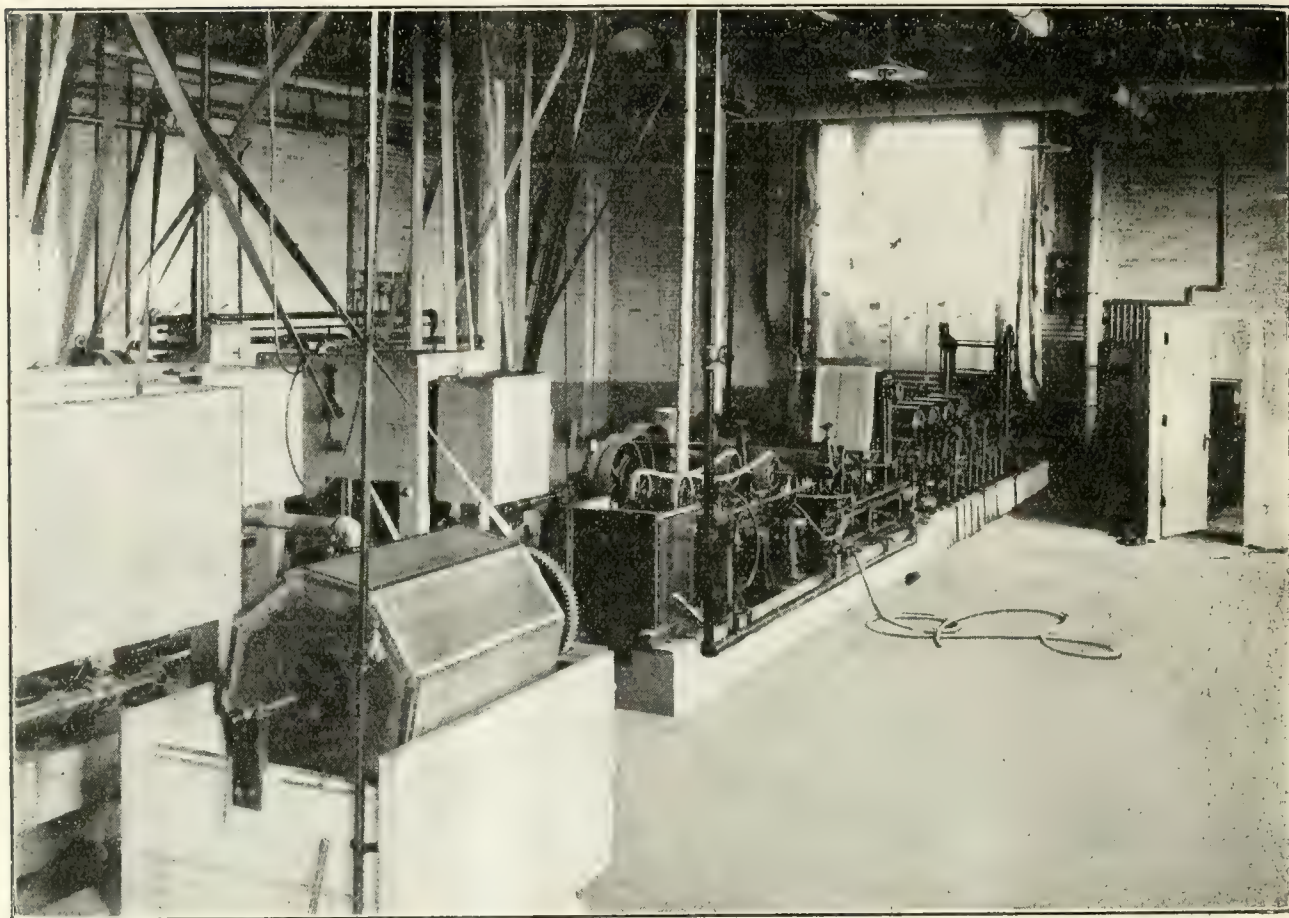
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Experiment in Wood-using Industries.

Some Account of the Wood Products Laboratory at Madison, Wisconsin

In this issue the *Journal* takes pleasure in presenting to its readers a number of illustrations showing the different branches of the Forest Products laboratory of the United States Forest Service, located at Madison, Wisconsin, U.S.A., and carried on in connection with the state University of Wisconsin.

This laboratory was opened on June 4, 1910, the inaugural exercises being held in the presence of a large number of visitors, representing not only the U. S. Forest Service and the university, but also most of the larger associations of lumbermen and other makers of wood products, railways and other interested bodies.



[Courtesy American Forestry.]

Experimental Pulp and Paper Mill, U.S. Forest Products Laboratory.

The laboratory building itself is a substantial two-story brick building, 180 feet by 80 feet in size. The state of Wisconsin erected the building and supplies water, light, heat and power. The United States federal government, through the Forest Service, provides the equipment, the staff, and all other maintenance. The railways furnish free carriage for the supplies of the laboratory, and lumbermen and other associations and companies are giving material of great value for experimental purposes.

The work of the laboratory, exclusive of the section of Maintenance, is divided into eight sections, namely, (1) Timber Physics, (2) Timber Tests, (3) Wood Preservation, (4) Wood Distillation, (5) Wood Pulp, (6) Chemistry, (7) Engineering, and (8) Pathology. (The last-named is conducted in connection with the Bureau of Plant Pathology, at Washington.)

The section of Timber Physics has as its work the study of the structural and physical properties of wood and the ascertainment of how these properties are affected by different methods of drying and handling. The equipment of the section includes microscopes, microtomes and other apparatus required for microscopical work, apparatus for taking microphotographs, a cylinder designed for the study of the different methods of drying wood and an experimental dry-kiln, balances, ovens, calorimeters and other miscellaneous equipment.

In the section of timber tests studies are made of the strength, stiffness, hardness and other mechanical properties of commercial wood. Tests are made on woods that have been treated with preservatives and other substances, to determine the effect of the preservative treatment upon the mechanical

properties of the natural wood. Tests here made of the relative strength, toughness, hardness and other properties of different woods will be of value in finding substitutes for woods now becoming scarce. Tests as to the influence of knots, checks and other defects in lumber will be of value to architects, engineers and others in making specifications and grading rules for structural timber. Tests of the strength of wood under different loads will assist in determining the working stress that may be placed upon timber structures.

The equipment of this laboratory includes one 200,000-lb. extension-base Reihle testing machine, one 150,000 lb. extension-base Olsen testing machine, three 30,000-lb. Olsen universal testing machines, one 60,000-inch-pound Reihle torsion machine, one Dory abrasion machine, one impact testing machine, deflectionometers and other instruments used in testing structural materials.

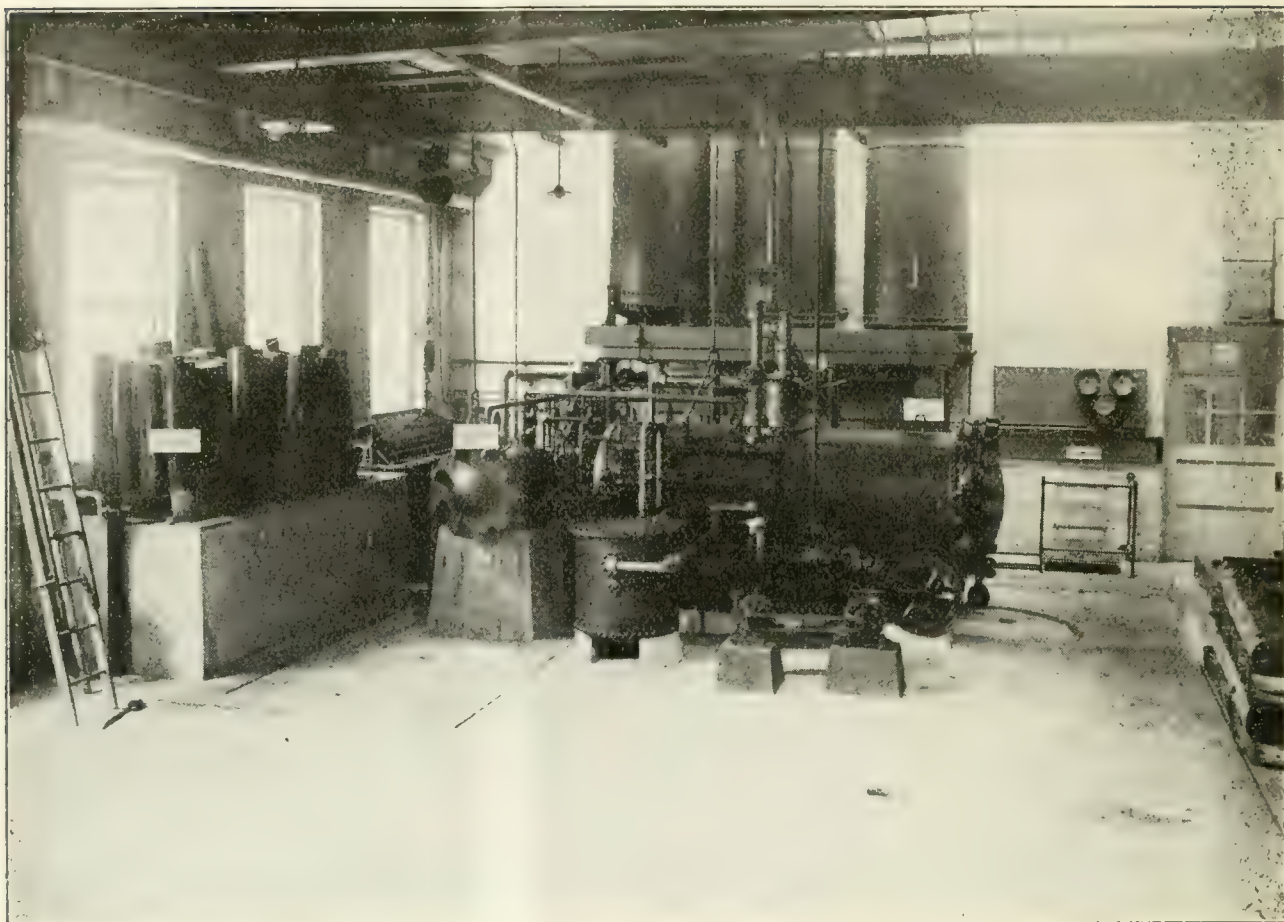
The wood-preservation laboratory's work involves the study of wood-destroying fungi and also the preservatives used to lengthen the life of wood and their effects on the wood. Its equipment includes a reproduction of a fully equipped commercial lumber-treating plant. In it are included one treating cylinder three and a half feet in diameter and twelve feet in length and a small experimental cylinder one and a half feet in diameter and three feet long. The apparatus is connected with a system of tanks, force-act and vacuum pumps for handling these preservatives and forcing them into the wood. An apparatus for the simpler 'open-tank' treatment is also provided. For the study of the specific effects of the preservatives on the wood a 'fungus pit' is provided; this contains chambers in which wood can be placed and thoroughly impregnated with the destructive fungi. Woods treated with the different preservatives are then

placed in this pit and isolated in chambers. The efficiency of the wood treatment is indicated by the ability of the wood treated to ward off the attacks of the fungi under these conditions.

The wood-distillation laboratory is equipped with a steam distillation and extraction retort, one oil-jacketed destructive distillation retort and three product continuous refluxing still and accessory apparatus. The work of the laboratory deals with the extraction of alcohol, turpentine, wood creosote, acetates and other products from wood. The design of the laboratory is to conduct experiments to determine what products of this kind can be secured from different woods and the best processes of obtaining them, to study the design and operation of machinery best adapted for the production of these by-products so that they can be produced most economically, both as to quantity and quality, and to study the refining of crude products.

The equipment of the wood-pulp laboratory includes a working model of all the apparatus of the pulp and paper mill, except the mill for breaking ground-wood pulp. (This has been subsequently located at Wausau, Wis.) This includes even a small, but complete, four-roller paper machine making a roll of paper fifteen inches wide. Its work includes methods of making ground-wood pulp to determine whether or not commercial pulp can be made from species other than spruce, the possibilities of treating different woods with the sulphite and soda processes, the qualities of paper which can be made from different grades of the various sulphite and soda ground-wood slabs, and the possibilities of using different forms of wood waste for the manufacture of pulp and other by-products.

The section of chemistry has a well equipped laboratory and is en-



[Courtesy American Forestry.]

Wood Preservation Room, U.S. Forest Products Laboratory.

Open-tank treatment on left; commercial treating plant in centre.

gaged in investigating such problems as the analysis and grading of commercial creosote, the analysis and grading of wood turpentine, and methods of analyzing treated wood to determine the kind and quantity of preservative in it.

The section of engineering has to do with the design of machines and apparatus to be used in saving wood waste, and so complete the work of other laboratories which have found that certain wood waste is capable of being utilized. This section takes up such work as the design of an experimental grinder for the manufacture of ground-wood pulp from woods other than spruce; the design of a dry-kiln for experimental purposes; the design of a hack for shallow chipping in turpentine experiments and the preparation of standard designs for different types of treating plants.

Some Results.

The work of the laboratory has shown good results. In little more than a year after its establishment important discoveries had been made. It was found, by the wood pulp section that jack pine and hemlock were satisfactory for ground-wood pulp, with the ordinary commercial equipment, slight variations in the process of manufacture only being necessary. Jack pine, dead or green tamarack and wood waste have been found satisfactory for chemical pulp, and good Kraft paper has been made from the clear waste of Western yellow pine and Southern yellow pine.

Western yellow pine has been tried for the production of various resinous products, and is found to produce more resin per year than the Southern yellow pine. A still has been devised for the manufac-

ture of turpentine from red or Norway pine by distillation which will remove the objectionable odor that this product has hitherto possessed.

Many tests have been made of the strength of various timbers, and the result of some of these has been incorporated in the building laws of the state of New York. Tests of fire-killed Douglas fir, have shown that this species does not suffer appreciably in strength from being killed in this way, so long as it remains sound.

Experiments in wood preservation have shown that, by varying the temperature and pressure in a vacuum-pressure plant it is possible to treat spruce and hickory, which under ordinary methods of manipulation cannot be treated.

In the work on wood seasoning, experiments in the kiln-drying process resulted in the devising of a kiln in which the temperature, humidity and circulation of the air can be controlled. In the section of wood preservation, commercial creosotes were examined and analyzed so that the purchasing public might know just what they were getting.

Many circulars have been published during the past two years and a half showing the results of the work of the laboratory. Among these are to be found such titles as the following: 'Experiments with Jack Pine and Hemlock for Mechanical Pulp' (Thickens); 'Commercial Creosotes' (Winslow); 'Strength Tests of Cross arms' (Wilson); 'Progress Report on Wood-paving Experiments in Minneapolis' (Bond); 'The Absorption of Creosote by the Cell Walls of Wood' (Teesdale); and 'Quantity and Quality of Creosote Found in Two Treated Piles after Long Service' (Batenou). Many other studies are under way which will be found useful to various wood-using industries.

Nearly eight per cent. of the Minnesota lumber cut in Canada is manufactured into boxes.

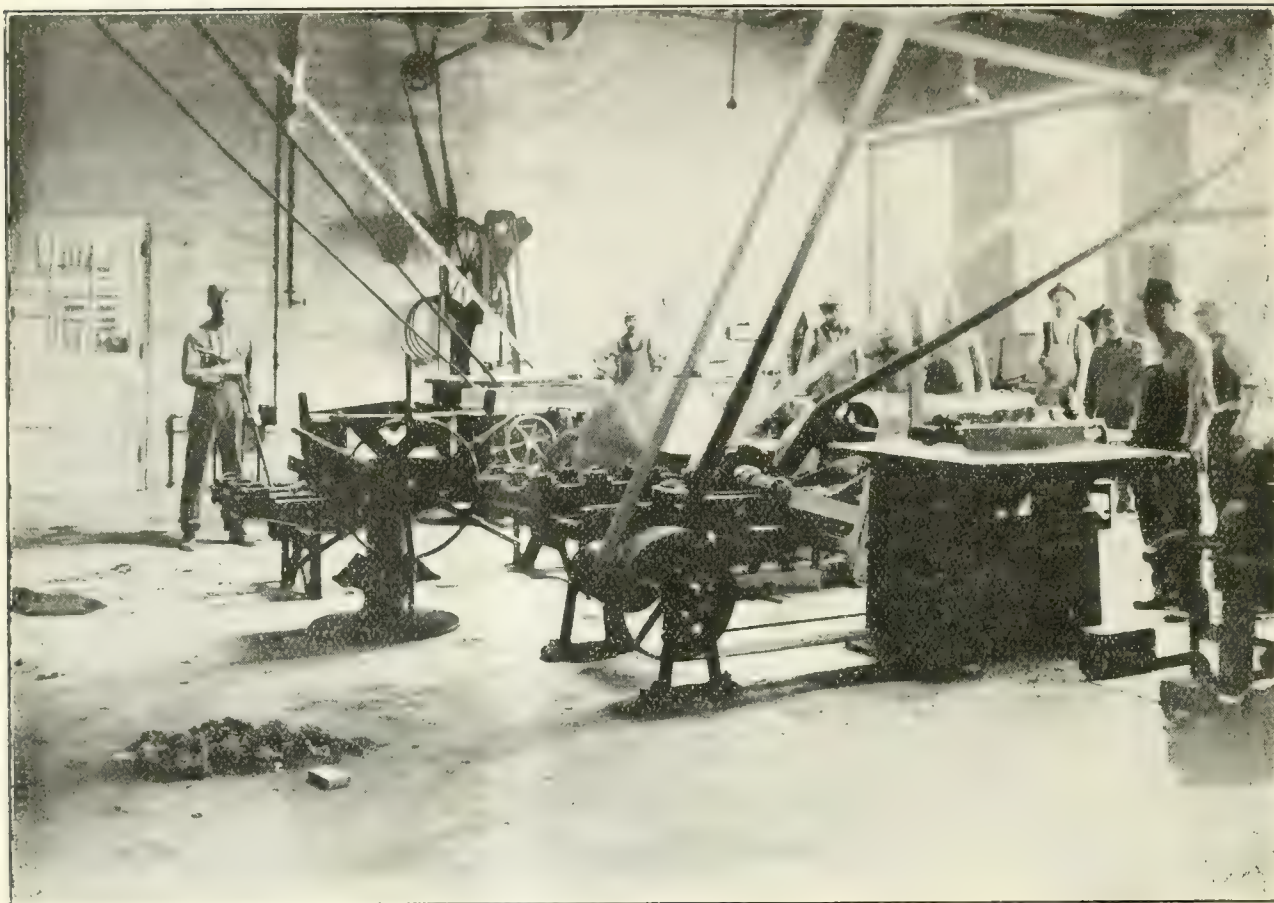
SOME GERMAN SHADE TREE PLANTING.

One of the pleasiest and most striking features of Frankfurt-on-the-Main, Prussia, is its wealth of verdure. In addition to the famous Palmengarten, the Botanical Garden, and a host of parks and squares, the "Anlagen," or parks laid out on the site of the former outer wall turn back about the beginning of the nineteenth century, encircle the center of the town. The southern part of the city is identified by its numerous gardens, nearly all residences having a garden, often a spacious lawn between street and house. The principal streets and highways are planted with shade trees. The planting of shade trees is carried on under the supervision of the Stadt-Quartiermeister, an office having charge of public parks, etc. Similar conditions prevail in other German cities.

The trees are generally planted at intervals of 8 meters (26 feet). Trees with spreading crowns are set a little farther apart, while those which do not spread are planted nearer together. Trees are planted with great care. The ground is prepared by digging a hole about 5 feet square and 2 feet deep, which is filled with the earth in which the particular tree prospers. In case of drought trees are thoroughly watered once a week at least in dry years. The branches are trimmed in September, & *Canadian Export*.

The soil of the city woods is found to be very fertile, and already a considerable portion of the township has been taken up by settlers. In most cases the land is very readily cleared and brought under cultivation, owing to the numerous trees not having removed the original heavy growth of timber, while the second growth has not yet reached any great size and is easily removed. *Report on the Growth of a Portion of Upper Wisconsin, Prairie County, Quebec, by Robert Hanna, p. 18.*

Forest growing in Canada on the west by Lake Thimbleton, Lake Umbagog, and only two streams in the area of any considerable size—Lacatapet and Thong creeks. Since 1860 all the forest has been removed, the wood and saw industry has all but quietly and completely, with the result that there are now few possible timber tributaries to these great lakes, and, of consequence, in a large number of cases, the settlers are obliged to get their supply of sawn lumber from the States on the east of a Portage at Lake Umbagog. *Practical Quebec Quebec, by Robert Hanna, p. 18.*



[*Courtesy American Forestry.*]

The Wood-working Shop, U.S. Forest Products Laboratory.

A Canadian Wood-products Laboratory.

Progress of the Project and Some of the Work it May Effect.

The Canadian Forestry Association, it will be remembered, at its meeting in February, 1912, passed a resolution endorsing the proposal to establish an experimental laboratory in connection with the Dominion Forestry Branch. Even before that the matter had been discussed in the Branch and preliminary inquiries made as to the establishment of such a laboratory, the lines of work to be taken up and the facilities at present existing in the Dominion to carry out such investigations.

McGill University was known to have done some work in wood-testing and other lines, and after some discussion it was decided to effect,

if practicable, an arrangement with the university for the use of its apparatus, the Branch furnishing other necessities. Experiments in the manufacture of wood-pulp are also mooted, as well as work in wood preservation.

The more such work is considered, the more it seems to be in the general interest that such experimental work should be carried on. In many of the bulletins of the Branch work in wood preservation has been urged, especially in regard to ties and poles, and it has been shown what important savings could be effected in annual maintenance, were the policy to be generally adopted of using these materials on-

ly after preservative treatment. Reference need only be made to Bulletins 13, 14, 21 and 22. This saving has already begun, two of the trans-continental lines having inaugurated the treatment of a certain proportion, at least, of their timber.

In the prairie provinces, too, where wood is so scarce, and where, for instance, almost any kind of stick is pressed into use for fencing, a tremendous saving could be effected were a practical apparatus brought into use by which fence-posts could be treated and their lives prolonged to say, double the present length.

Another question of interest to Canadians, especially in the West, is the possibility of substituting Douglas fir for the Southern pine so much of which is now imported from the United States. Tests made of the two timbers seem to indicate that the Douglas fir, as regards its mechanical qualities, such as resistance to bending and compression, etc., is almost, if not quite, equal to its rival, while in regard to physical qualities, such as ease of working, capacity for taking a high polish and appearance generally the

native wood can successfully compete with the imported.

Other problems, such, for instance, as the devising of a suitable means for treating wood in comparatively small quantities for use in paving, for smaller communities, readily suggest themselves. The manufacturers of wood-goods also have many problems of their own, and it is apparent that were such a laboratory established there would be no lack of questions for solution.

Cordial support from manufacturers using wood is practically assured. The Canadian Manufacturers Association has been approached as to its attitude on the subject, and is found to be favourable. So much in favour of the project is the Lumbermen and Shingle Manufacturers Association of British Columbia that they have already offered to supply material gratis for tests. Meanwhile the project continues to make substantial, if slow, progress, and it is hoped that before long Canada, too, will have established, probably in connection with some of its larger universities, an efficient laboratory such as the United States already possesses at Madison.

USE OF CEMENT IN CANADA

With the great rise in price of wood during recent years cement has come into a leading place as a wood-substitute. The following table, taken from Mr. Richard Grigg's report to the Department of Trade and Commerce, shows the increase in use during the five years from 1904 to 1908 (inclusive), and also the way in which Canadian cement manufacture has increased while the import has at the same time lessened:—

Year	Cement made in Canada	Cement imported into Canada	Total
1904	608,000	1,844,840	2,452,840
1905	1,341,000	617,028	1,958,028
1906	2,152,500	606,071	2,758,571
1907	2,401,510	677,070	3,078,580
1908	3,400,000	480,040	3,880,040

A BEAVER'S WORKING DAY

(Hesper's Weekly.)

A young beaver in Hesper's Park and dense Lumbago was once placed at work upon a tree twelve feet long and two feet six inches thick, just as the trees above mentioned the hour of noon. The beaver began by working the tree a foot above the ground. That done, he attacked the wood. He worked hard, alternating his labor with dips on his battering post. He bathed and labored alternately until a clock in the afternoon, when he ate his supper of bread and carrots and pulled about in his pond until half past 5 o'clock. Ten minutes later, when only one inch of the tree's diameter remained intact, he gave up for work, and the tree fell. Before it fell the beaver put on one of those blue overalls that a school-teacher wears. Then, as the tree lay on the ground, he performed a out-mental and again began to grow.

He worked at intervals all night, and the log into three parts, and two of the portions into the water, and reserved the other third for his permanent shelter. The work done by such a beaver.

Forest Research in India.

In connection with the Indian Forest Service, research work is being developed by the Forest Research Institute at Dehra Dun, where is also located the Forest School for training the lower grade of forest officers. The constitution of the institute was announced by order of the government of India in 1906, six officers being provided for. The list of officers has been somewhat modified since that time, and is now constituted as follows:—(1) Silviculturist, (2) Forest Zoologist, (3) Forest Botanist, (4) Forest Chemist, and (5) Forest Economist.

Prior to this date research work had to a certain extent been done by forest officers as opportunity presented itself, (especially on leave) and some work of considerable merit accomplished, e.g., the late Sir Dietrich Brandis's "Forest Flora of India." Owing, however, to lack of any recognized medium for publication much valuable original work done by departmental officers was lost.

The progress of research work, however, has not come up to the hopes entertained, owing, partly, to lack of funds, partly, to the officers having had much of their time taken up in educational work.

Among the results of the research work, however, have been the introduction of a better system of working sâl and teak forests, improved methods in the distillation of turpentine, and important investigations in paper-making. Investigations into the question of woods useful for match-making have resulted in the establishment of at least one match-factory.

Many bulletins have been issued by the Institute on various lines of forest research, some of these, e.g., 'Indian Woods and Their Uses' (Troup) being large works in themselves. A large Research Institute building is to be erected, at a cost of 160,000 rupees (about \$52,000), the land—one of the finest sites in Dehra Dun—having been secured some time ago.

IN GERMAN FORESTS.

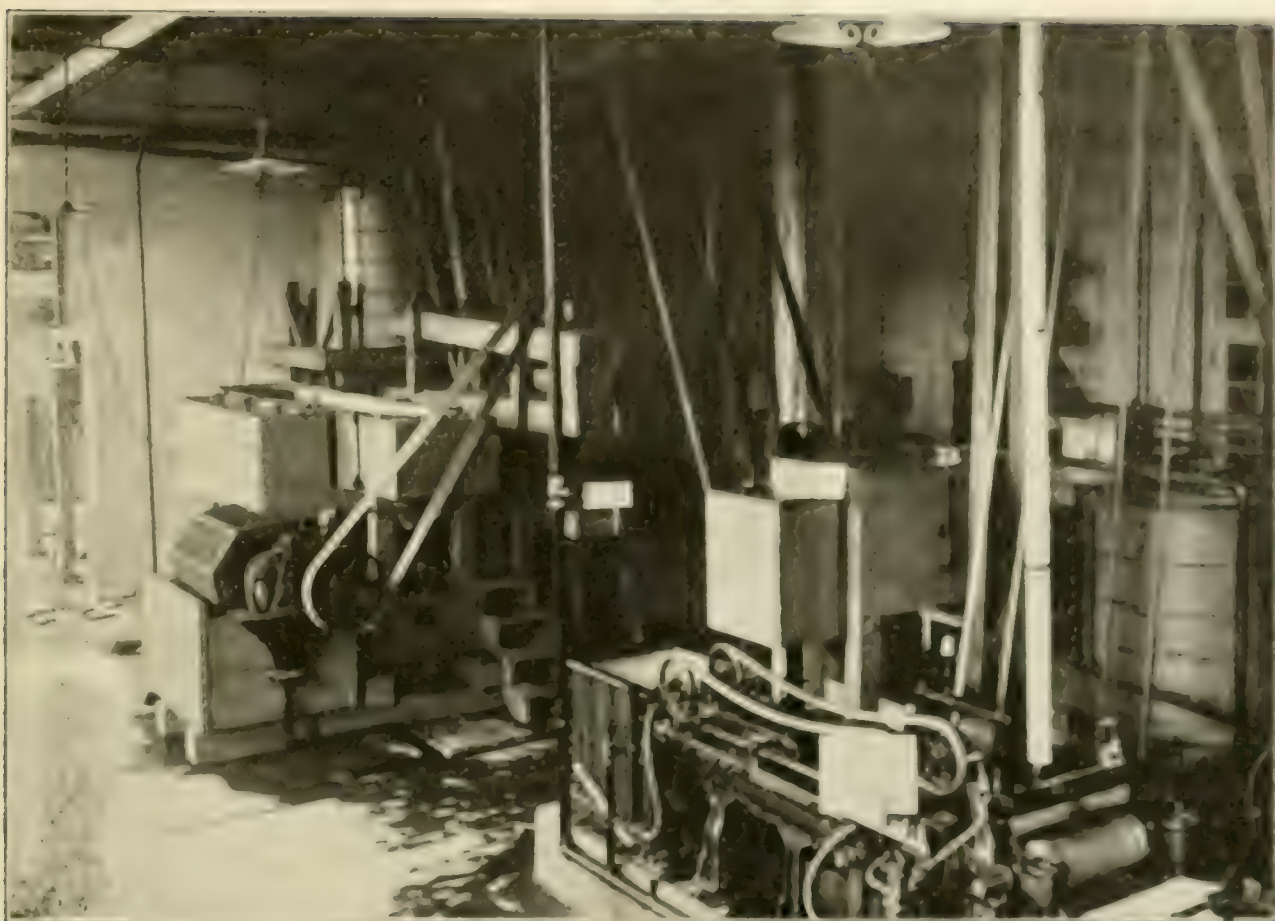
It is very interesting, too, at this time of the year, to watch the woodcutters at work slaving, skinning, and trimming the giants of the forest. The timber from the Schwarzwald is a tremendous source of revenue to the State. Freiberg is fortunate in owning the large tracts of forest immediately surrounding the town whence it derives a large income.

In our walks we see hundreds upon hundreds of these trees, mostly firs, and beech, bereft of bark, lying prone ready for transportation. So long, so straight are they, I often wonder if they will all be used for ships' masts. Odd sorts of trees, smaller, or crooked ones, it would seem, are cut up for firewood, for we also see yard-length logs stacked for fifty yards or more beside the paths.

On two days in the week the peasants are permitted to collect the twigs, bark, and chips for firewood, but permits must be

procured from the town. The two days appointed for the purpose are also the days when the school children have half holidays. In these mid-November days, therefore, a very common sight in the loneliest depths of the woods is a whole family, grandparents, parents, and numerous children, with all sorts of improvised push carts, collecting their firewood for the winter.—Louise H. Birchall in *Toronto Star*.

Already about 30,000 Scots pines have been planted at the source of the Carthage water-supply near Indian River in New York State. Ten thousand more trees are being planted this year, and it is the intention of the village of Carthage to reforest the entire two thousand acres of land owned by the municipalities at this place. The municipality expects to derive benefit both in the conservation of its water-supply and also in the shape of timber for sale.



[Courtesy American Forestry]
One End of Pulp and Paper Mill, U.S. Forest Products Laboratory

Les Dunes et les Landes de Gascogne.

Sur les rivages du golfe de Gascogne, en France, la mer rejette d'énormes quantités de sable. D'où vient ce sable ? Un peu de l'érosion des flots sur les fonds sous-marins et sur toutes les falaises de la côte — pour la plus grande partie, des *dolomites* (1) de la Gironde. C'est le dernier produit de l'érosion des montagnes apporté peu à peu par la Gironde et tous ses affluents. Les courants marins viennent mordre ces dépôts sublevés et le flot des marées les épand sur les rivages. Le vent d'ouest s'en empare à son tour et chasse le sable vers l'intérieur des terres où il ne tarde pas à

former des monticules allongés qu'on appelle des *dunes*.

Ces dunes sont instables, comme les éléments molles dont elles sont constituées. Elles se déplacent peu à peu sous l'effort continu du vent qui secoue incessamment la poussière accumulée pour la transporter plus loin. Vers le fin du siècle dernier (v. l. 1840) les dunes s'étendaient à plus de 5 kilomètres de la côte. Elles recouvraient les cultures, les forêts, barraient les champs d'eau et les forçaient à s'écouler en ruisseaux malsains. Alors s'était formé entre la Pointe de Grave et Bayonne un défilé de 200 kilomètres de long sur une largeur moyenne de 2 kilomètres.

L'État s'occupait à transporter les dépôts des terres rivérales

(1) *Dolomites* de la Gironde. On dit de la portion du lit couverte de graviers et de limons et abondamment imprégnée par le courant des eaux.

Déjà plusieurs villages avaient été ensevelis. Déjà le bourg de Teste apparaissait comme menacé de destruction dans un avenir prochain. Déjà on avait pu calculer que dans un nombre de siècles déterminé par la marche annuelle de l'envahissement (20 mètres environ) les sables atteindraient par terre le port de Bordeaux, déjà menacé directement par les apports du fleuve.

En 1787 un grand ingénieur, Brémontier, s'aidant des observations et de quelques essais faits précédemment dans la région, traça et parvint à faire mettre à exécution un programme de travaux en vue de fixer par la végétation forestière les sables envahisseurs. Sur cette arène mobile, là où la nature, réduite à ses seules forces, s'était arrêtée, impuissante, l'intelligence, la volonté opiniâtre d'un homme réussirent.

Par des clayonnages disposés à l'encontre du vent de l'ouest, par des couvertures de branchages que des crochets de bois fixaient au sol, par des semis de plantes herbacées ou semi-ligneuses: le *gourbet*, le *genêt* et l'*ajonc*, on parvint à fixer momentanément les sables et à donner aux jeunes semis de *pin maritime* l'abri et la protection temporaires qui seuls pouvaient leur permettre de se développer.

Là où l'on ne voyait ni un arbre, ni un buisson, ni une touffe d'herbe, s'étendent aujourd'hui les ondulations verdoyantes d'une immense *pineraie* (1). Là où la gorge desséchée ne respirait que la poussière sableuse soulevée par le vent, règne maintenant une atmosphère humide, tout imprégnée de parfums de résine. Là où l'homme voyait avec terreur le sable stérile s'avancer chaque jour, menaçant d'ensevelir ses cultures, ses vignes, sa demeure, se trouve pour lui une inépuisable source de profits.

Toute une population est occupée à exploiter, façonner, transporter des bois et surtout extraire de ces pine-

raies de pin maritime cette matière précieuse — la résine — qui sert à la préparation de tant de produits industriels. (1)

Cette transformation de la zone des dunes prépara et provoqua une autre transformation non moins importante. Derrière ces monticules de sable qui s'étendaient tout le long des rivages, s'était formée cette immense zone marécageuse connue sous le nom de *Landes de Gascogne*. Au désert sablonneux et aride du littoral succédait le steppe humide et malsain, presque désert aussi; rien de plus triste que l'aspect de cette vaste plaine inculte, en hiver à demi envahie par les eaux, — en été couverte d'ajoncs, de bruyères et de grandes herbes desséchées par le soleil. On l'a représentée souvent avec ses larges et mélancoliques horizons, ses troupeaux de moutons étiolés que des bergers perchés sur de hautes échasses, le teint hâlé, la face amaigrie, promenaient à travers la lande, et çà et là, sur de petites éminences, à l'abri d'un bouquet de pins (*pignada*), une misérable chaumière ou un pauvre village dont les habitants luttent péniblement contre la misère et la fièvre. — Ici encore l'homme a triomphé de la nature — après avoir vaincu le désert, il a vaincu le marais.

Une homme dont le nom vient à côté de celui de Brémontier, l'ingénieur Chambrelent, entreprit de remettre en valeur ces landes stériles. C'est l'arbre forestier, le pin maritime surtout, qui fut encore l'instrument de régénération.

Mais pour qu'il pût réussir sur ce sol inondé, une grande partie de l'année, il fallait tout d'abord par un vaste réseau de canaux d'assainisse-

(1) Applications de la résine: couleurs, vernis, savons, bougies, torches de résine, cires à cacheter, goudrons, poix, noir de fumée, graisse végétale ou graisse de résine pour machines, encre d'imprimerie, etc. — calfatage des navires — injection des bois — industrie du dégraisage — préparation de vêtements caoutchoutés et imperméables, — soudure de certains métaux, utilisations médicinales et thérapeutiques, etc.

(1) *Pineraie*. Bois de pins.

ment assurer le libre écoulement des eaux stagnantes.

Et pour qu'il pût donner lieu plus tard à des exploitations fructueuses, il fallait des routes de pénétration, des chemins de fer.

En une quinzaine d'années, ce magnifique programme de restauration, qui s'étendait à plus de 600,000 hectares, fut presque complètement réalisé, et à la forêt bienfaisante des dunes, s'ajouta l'immense forêt landaise, plus bienfaisante encore; car si l'invasion des sables faisait reculer l'homme, le chassant de son pays, de son habitation, le marais faisait pis, il le tuait, lui infusait le lent poison de la fièvre.

Or la forêt, complétant les résultats des canaux d'écoulement et d'évacuation des eaux, fit bientôt de cette région l'une des plus saines du globe. Là où un médecin employait autrefois pour soigner sa clientèle 1 kilo-gramme de sulfate de quinine, 100 grammes lui suffisent aujourd'hui. Là où la vie moyenne de 1853 à 1859 était de 34 ans 9 mois, elle est maintenant d'après les statistiques portant sur le nombre des décès et l'âge des décédés de 38 ans 11 mois et 19 jours. Plus de 4 ans d'existence gagnés par chaque citoyen de la patrie landaise! Et quelle transformation plus merveilleuse encore dans son existence elle-même! Quel prodigieux accroissement d'aisance, de bien-être, de prospérité! La cabane sordide en bois ou en chaume où, pendant l'hiver, l'habitant sans feu grelotte du froid, de la fièvre et parfois de la faim, où toute la famille dévorée par la scrofule, la pellagre, s'entasse dans une promiscuité misérable, est remplacée par des maisons en pierres, propres, saines, confortables, où dans les cheminées, pendant les froides journées, flambe constamment la flamme pétillante du bois résineux.

C'est qu'il vient de l'argent maintenant dans ce pauvre pays!

L'argent semble sortir de terre, et il en sort bien, en effet. Ce sont ces bois de pins qui le produisent, qui le font jaillir du sol et le répandent sur toute la contrée comme ils répandent leur graine et leur parfum de résine. Ces bois, toute la population est employée à les exploiter, à les façonner, à les transporter sur les routes qui partout sillonnent le pays. On en extrait la résine comme pour les bois des dunes. On les débite en staves de mines, en traverses de charbons de fer, on en fait des poteaux télégraphiques, des pavés de bois de la paille à papier. Des charbons de fer les conduisent jusqu'à Bordeaux et de là ils se répandent dans toute la France et à Paris principalement, où ils sont utilisés pour le chauffage des foyers des boulangers et pour les pavages en bois; en Angleterre, où ils font concurrence aux bois de Suède et Norvège, en Espagne, sur toutes les côtes de la Méditerranée et jusque dans les deux Amériques. Autrefois cette immense surface de 800,000 hectares comprenant les dunes et les landes de Gascogne était presque sans valeur. Autrefois les landes les plus rapprochées des villages ne trouvaient pas acheteur à 50 ou 60 francs l'hectare. On raconte même que dans les régions les plus désertes, quand on voulait vendre une terre, on conduisait l'acheteur sur une éminence et on lui criait pour quelques francs toute l'étendue où il pouvait faire entendre sa voix.

Aujourd'hui cette immense surface, plantée presque partout de pins maritimes, exporte ses produits aux quatre coins du monde. Elle aura bientôt une valeur de plus de 1,000 francs l'hectare, soit au total de près d'un milliard de francs. Elle paye ses cultivateurs, sous forme de rentes de seigneurs, de profits industriels et commerciaux, un total annuel de plus de cinquante millions de francs!

Et tout cela est à Tarterre, c'est à la forêt qu'elle le doit!

Forest Insect Conditions in the Riding Mountains, Manitoba.

By J. M. Swaine, Assistant Entomologist for Forest Insects, C.E.F., Ottawa.

During May of this year the writer visited the Riding Mountain forest reserve, Manitoba, with the objects of introducing European parasites of the larch saw-fly and studying the forest-insect conditions of the region. The weather was excessively wet and cold throughout the month. On the upper plateau there were practically no buds started before the end of May, and insects were nearly all still in hibernation.

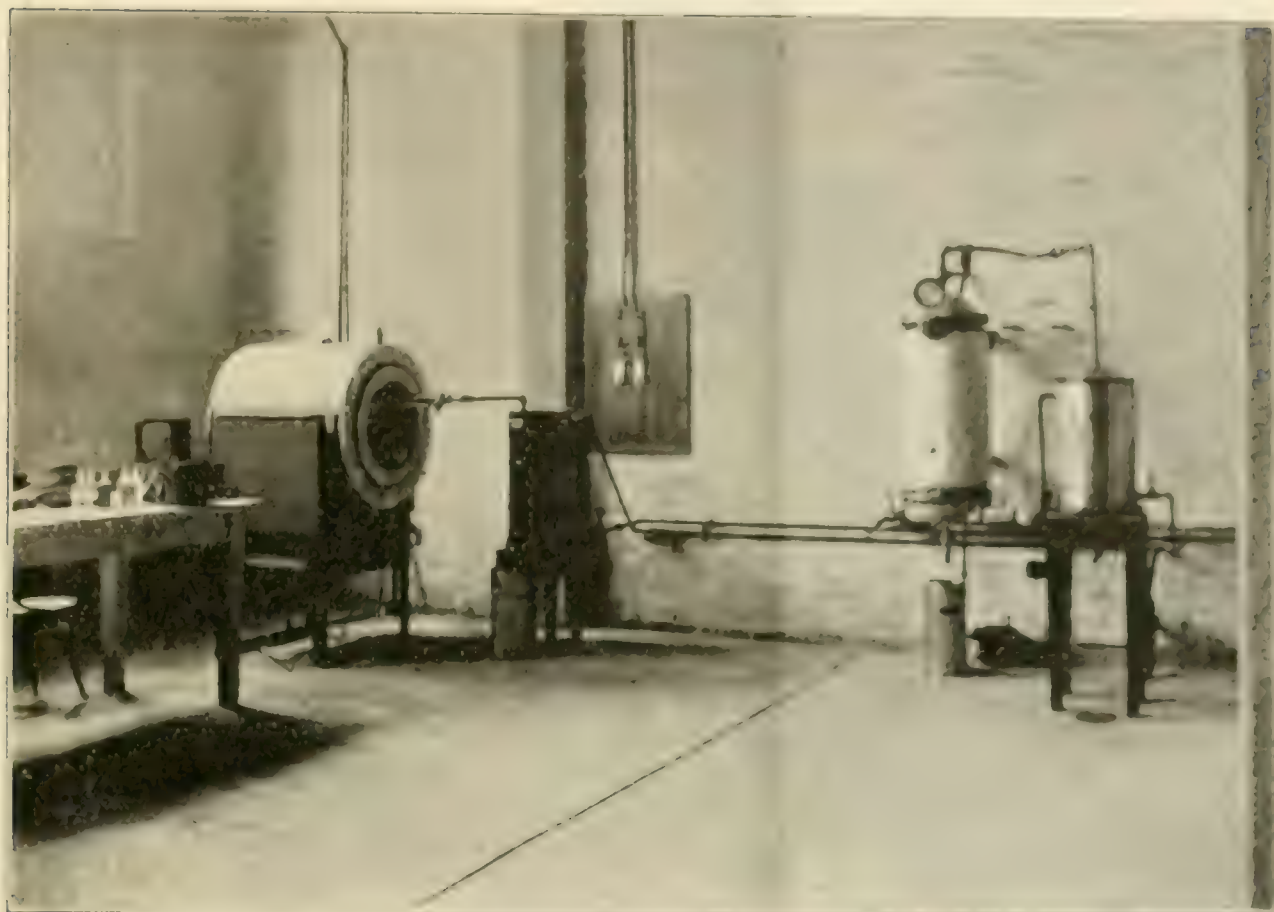
In view of the rapid western spread of the larch saw-fly, its great devastations throughout Eastern Canada, and the value of the larch to western farmers, the Entomological Division attempted the colonization in Manitoba of the European parasite of the larch saw-fly, *Mesoleius tenthredinis*. This ichneumon has been particularly efficient in controlling the saw-fly in Great Britain. Through the efforts of Dr. C. G. Hewitt a large supply of parasitized cocoons of the saw-fly was obtained from England. These were planted in two larch swamps in the Riding Mountains, east of Clear Lake. The abnormal lateness of the season this year was unfavourable to the attempt, but effective results are hoped for. It is important to note that the parasitic fungus of the saw-fly, *Isaria farinosa*, was introduced in the same cocoons.

The larch saw-fly, *Nematus erichsonii*, is now widely distributed in the larch of Manitoba. In the Riding Mountain forest reserve, and in the Spruce Woods forest reserve it is abundant, although not yet particularly destructive. It is without doubt spreading to the west and north, and will ultimately extend wherever the larch is found. The only hope of

influencing its control is in the introduction and distribution of its parasite and fungus enemies. Its young or larvae feed upon the larch leaves like caterpillars, and strip and kill the trees when present in large numbers. Although not yet destructive in Northern and Western Manitoba, the saw-fly has committed serious ravages to the larch, in recent years, throughout Western Ontario.

Bark-beetles are present in the reserve in great numbers in fire-injured timber and slash from cuttings. Aside from the larch saw-fly these beetles are the chief insect danger for the future. They are small black, or dark brown, hard-shelled beetles, which excavate tunnels and deposit eggs in the inner bark of living or dying trees. The grubs which hatch from the eggs feed upon the bark, often cutting individual mines. They pupate in the ends of these larval mines, and after maturing to the adult form, eat their way out through the bark, leaving small round holes like shot-holes. Some species are the most destructive of all forest insects.

Only a limited amount of cutting is allowed in the reserve, and this is chiefly in fire-swept areas. There were several considerable burns in the spring of 1911, and in these the bark-beetles were present in spruce and pine, in immense numbers. There were no fires of importance in the reserve this spring, and consequently little cutting of green timber. There is danger of an outbreak of bark-beetles of the genera *Dendroctonus* and *Polygraphus* in the neighbourhood of these 1911 fire areas. One species of these (*Dendroctonus murrayanae* Hopk) has already destroy-



(Continued American Forester)

Wood-distillation Room, U.S. Forest Products Laboratory

ed some timber there; but it is not noticeably common in healthy trees. A few dendroctonus-killed jack pines may be seen along the Clear Lake trail. Conditions are being carefully watched by the officers of the reserve and any outbreaks will receive prompt attention.

The larch dendroctonus, *D. simplex* Lee, is very common throughout the parts visited. It was found in great numbers in dead, standing larches, but whether or not it had been the primary cause of the death of the trees could not be then determined. This species prefers bark in a dying condition, but may become an important auxiliary of the larch saw fly in future years. *Ips perturbatus* Eichh. and *Ips cinctus* Eichh. are very abundant in fire areas south of Clear Lake. They are found there chiefly in white spruce which was badly injured by fire. *Polygraphus rufipennis* Kirby, the spruce bark beetle, is common

everywhere in dying bark of spruce, larch and jack pine. These species are able to kill weakened or injured trees which might otherwise recover. Other species of bark beetles of lesser interest are abundant in dying bark of spruce, pine and larch.

Timber beetles of several species are plentiful. *Trypandrotus retusus* Lee, the poplar timber beetle, in poplar, and *T. lineatus* Ratz., the spruce timber beetle, in spruce and pine, are the most common. These beetles drive their small, round, black tunnels more or less deeply into the wood of dying or recently killed trees and logs of heavily cut lumber, and reduce its value for all but charcoal purposes. They also assist in the introduction of fungi and bacteria into the wood. Many poplars on the upper plateau are more or less decayed by them. These scrapings penetrate to the cambium, and prevent an ideal condition of soil for the growth and harvest

The poplar timber-beetle enters later on these scraped surfaces, and through its tunnels spores may reach deeper layers.

Damage to killed and injured spruce and pine by cerambycid and buprestid borers is extensive. Piled lumber cut in the fire areas by portable mills showed abundant evidence of their borings. The fires occur usually early in the spring. These beetles lay their eggs in slits or crevices in the bark late in June and in July. They seldom deposit their eggs on barked surfaces. The grubs cut large, rounded or flattened tunnels through the bark and wood.

To prevent the injury by these borers it is necessary to bark the trees, or put them in water when possible, before the young grubs have worked through the bark and into the wood, or to saw before they are deeper than the thickness of the slab. Some species will continue their borings in piled lumber, or even in parts of buildings, for months or even years, if they have penetrated deeply before the logs were sawed.

Every effort should be made to get on the ground as early as possible and to rush the sawing during the first part of the season. Much of the trouble might thus be left in the slab.

Throughout the reserve the poplar is badly infested with fungi, and with boring grubs of the long-horned beetles (*Cerambycidae*). The only conceivable method of controlling either the fungi or the beetles is to cut and burn, at the proper season, all infested trees. Such an operation could not be considered at the present time, and these diseases of the poplar are likely to continue.

About fifty years ago there must have been a considerable outbreak of *Pissodes* beetles (spruce and pine weevils) particularly in white spruce. The grubs of certain species of these weevils destroy the terminal shoots of young trees. One, two or three laterals then develop as terminals and

produce a distorted trunk, frequently with two or even three tops. These 'double-tops' are fairly common throughout the parts of the reserve visited, as trees forty or more years of age. No recent work of this kind was seen.

In spite of the inclement season, an important advance was made on this visit in our knowledge of the injurious insects of that region.

It is a pleasure to notice the excellent condition into which the reserve is being put. New ranger-stations were being built, important trails were being cut, and telephone lines laid to connect the ranger-stations with each other and with headquarters. A wide fire-guard already surrounded a large portion of the reserve.

Aside from the value of the wood it contains, and the abundant game which it supports, this reserve is invaluable as the source of several small rivers which sustain the fertility of a wide belt of surrounding wheat-lands. The value of such forest reserves, through the West, at the sources of water-supply, cannot be overestimated. Upon the permanence of the reserves practically depends the fertility of the surrounding regions.

DOUGLAS FIR VS. NORWAY SPRUCE.

Some experiments made in the Ardennes with the Douglas fir as compared with the Norway spruce (*Picea excelsa*) gave the following results:—

Douglas fir—Age, 25 years; height, 4 to 16 m. (13 to 52 ft.); average height, 14m (46 ft.); volume per acre, 2,032 cu. ft.

Norway spruce—Age, 25 years; height, 4 to 14m. (13 to 46 ft.); average height, 8m (26 ft.); volume per acre, 812 cu. ft.

These data confirm the great superiority of the Douglas fir with reference also to the quality of the timber. This tree seems particularly well suited to damp climates, such as Belgium. The slower-growing blue Douglas seems less adapted to such a climate.—Bulletin of Ag. Statistics (Canadian edition), Vol. I, No. 8, July 20, 1911.

ONTARIO MOVES AHEAD.

The Ontario government has recently announced an advance step in its forest policy by the appointment of Mr. E. J. Zavitz, M.S.F., to the position of Forestry Commissioner for the province. This is a position just created (so far, at least, as title goes) in the provincial service, and it seems significant that it is attached to the Department of Lands, Forests and Mines. Mr. Zavitz will advise the department as to cutting methods, disposal of brush, and generally as to lumbering methods on Crown lands in the province, and reforestation in general. For the present the work at the Ontario Agricultural College and in waste land planting in Norfolk county will also be under the direction of Mr. Zavitz. This appointment looks like an important forward step in the forest policy of the province and the *Journal* echoes the wishes of Mr. Zavitz's many friends for all success in his new office.

MEETING OF DIRECTORS.

Important Interview with the Right Honourable the Prime Minister and the Minister of the Interior.

An important meeting of the Directors of the Canadian Forestry Association was held in the board room of the Ottawa House of Trade on Dec. 6. As it was not possible for the President, Mr. John Henry, of Vancouver, to attend, it was expected that the Vice-President, Hon. W. A. Charron, M.P., would preside, but as he was detained at the House of Commons through imperative parliamentary business, the chair was taken upon motion by Mr. G. V. Chenevix-Tait, President. A number of the Directors unable to be present forwarded their views on the questions coming up for discussion, and these in every case came in line with the decisions reached. As the main object of the meeting was to present to the government the resolutions passed at Victoria, this was arranged and the resolutions selected at

the first part of the meeting, and after the interview the other matters were disposed of.

The resolutions which affected the work of the Dominion Government, and which were presented on this occasion, dealt with improved regulations desired in regard to (1) disposal of debris; (2) spending on timber lands; (3) extension of forest reserves; and (4) increasing efficiency in the national forest service. The first three were presented with a few words of explanation, and attention was centred on the last.

At 12.45, according to appointment, the Directors met the Rt. Hon. H. L. Borden, Prime Minister, and Hon. W. J. Roche, Minister of the Interior, in the office of the former, the delegation being composed of Mr. Chenevix and the following Directors—Messrs. Wm. Little, Montreal; Horat Robinson, Ottawa; Thomas Smithworth, Toronto; Gordon C. Edwards, Ottawa; Edward Wilson, Grand Maré, Que.; Senator Harnack, Deser, Murphy, Ottawa; Ed. C. Haddon, Melbourne, Que.; W. C. J. Hall, Quebec; and Mr. Geo. Murphy, of Ottawa, the last of whom was especially delegated to the limit holders of British Columbia. The resolutions were presented by the suggestion by Mr. Chenevix, who briefly and aptly pointed out the imperative need for increasing efficient use to a service so widely extended and depending so much upon individual initiative, judgment and faithfulness in the forest service. He drew attention to the resolutions passed both at Ottawa and at Vancouver on this subject, and read a telegram from the British Columbia Land and Shingle Manufacturers' Association, containing a strong remonstrance at the same time passed by that body on Dec. 2. He was followed by Senator Harnack, who spoke of conditions in British Columbia, and Mr. Edward Wilson, who dealt particularly with Quebec. All three handled the subject in a very happy manner, speaking with confidence and conviction.

In replying, the Prime Minister said that in presenting the three resolutions he was coming from the Minister of the Interior a memorandum dealing with the organization of the forest service and its work. After reading this memorandum to the delegation he said that he was fully aware of the great and increasing importance of the forests of Canada and of the need for a service of the highest efficiency. The Government was giving these matters particular attention, and he thought that the point here of the imagination could not be in the future that the best men in the land will flock to these posts. After Mr. Chenevix and some of the others had given some further explanation to the Minister of the Interior the negotiation continued until satisfied with the result of their interview.

Some Recent Forestry Books.

Quite a number of important books on forestry have appeared of late, and the *Journal* has pleasure in presenting to its readers the short reviews of some of the most important of these which follow.

New England Forestry.

A significant mark of the advance of forestry on this continent is the increase in the literature of the subject. For years foresters were so busy with practical matters that little or no time was left to write on forestry, except in reports, bulletins and similar publications, and the student in search of information had to pick out the information he wanted from a mass of these. Of late, however, the foresters have had, as it were, time to take breath, to collect and systematize this information, and a forestry literature has had time to grow up, adapted to the conditions of this western continent.

Naturally forest mensuration, owing to its close connection with the utilization of wood, claimed first attention, but of late the would-be silviculturist has been receiving his share, as shown by the publication, last year, of Mr. H. S. Graves's *Principles of Handling Woodlands*, and lately of the subject of this review, Messrs. Hawley and Hawes' *Forestry in New England*.* The two books necessarily cover something of the same ground. The difference between them lies in the fact that Mr. Graves's book deals with the subject of silviculture (in the broadest sense) along comparatively general lines, while the authors of the latter work have taken a specific region for treatment and design to give owners of that region practical directions for the treatment of their forests, and, to a lesser degree, of disposing of the products.

The importance of Messrs. Hawley and Hawes's book to Canadians lies in the fact that forest conditions in parts of New England are much the same as those in parts of Canada. Forests in the state of Maine require practically the same treatment as those in New Brunswick and southeastern Quebec; the white pine lands of Ontario, as well as the hardwood lands of the same province, call for the same treatment as corresponding areas in parts of New England. The different forest regions are taken

up in Part II of the book, Chapter XIII dealing with the Spruce region, Chapter XIV with the Northern Hardwoods region, Chapter XV with the White Pine area, and Chapter XVI with the Sprout Hardwoods area. Each of these is treated under the following headings:—General Considerations, Forest Types, Methods of Handling the Forest, Logging Methods, Market Conditions, Industries, Character of the Land and Timber Ownership, and Forest Protection. Immediately preceding these chapters is a short treatment of 'Present Forest Conditions', which includes a section on 'How to Find Information Applicable to a Particular Tract.' This should enable a timberowner to decide to which division his forest belongs, and under that division he can identify the type of forest in which his property is included, and further on in the chapter he will find directions given as to the proper treatment of this tract.

The second part of the book contains also chapters on 'The Progress of Forestry in New England' and 'The Yield to be Expected from New England Forests under Proper Management,' and in the appendices are given forest fire statistics, a bibliography of works dealing with forestry in New England, volume, growth and yield tables and log rules.

Part I of the book deals with General Forestry. Starting with Silvies (the general consideration of the conditions affecting the growth of forests) in Chapter I, the authors next take up, in Chapter II, the different silvicultural systems, under the general divisions of reproduction of forests from seed and reproduction from sprouts. In Chapter III the different trees of the region, *e.g.*, White and Red Pine, Spruce, Yellow Birch, etc., are dealt with separately. Chapter IV contains a discussion of practical methods of planting and seeding of forest trees, planting being strongly favored. Improvement Cuttings are discussed in the next chapter under the headings of Cleanings, Liberation Cuttings, Thinnings and Damage Cuttings, with directions for each and for cuttings in general.

The next three chapters deal with Forest Protection. A short chapter of some four pages deals with damage from the larger (vertebrate) animals. Chapter VII deals with Forest Insects and Fungi, briefly treated, *e.g.*, the white pine weevil, spruce-destroying beetle, spruce budworm and larch saw-fly (considerable use being made of the work of Dr. C. G. Hewitt, as published in the 1911 report of the Canadian Forestry Association) and, among the fungi, the chestnut bark disease, white pine blister

**Forestry in New England: A Handbook of Forest Management*, by Ralph C. Hawley, M.F., Asst. Professor of Forestry, Yale Univ., and Austin F. Hawes, M.F., State Forester of Vermont. New York: John Wiley & Sons; London: Chapman & Hall. Pp. xv. + 479. Price, \$3.50.



**Avenue of Green Ash at the Rancho of Dixon Bros., Maple Creek, Sask
Fifteen Years from the Seed**

rust, etc. A chapter (VIII) is also given to forest fires and their extinguishment, estimating the damage done by a forest fire is also briefly treated.

In the chapter on Timber Estimating the use of volume tables is explained, methods suitable for estimating forests of different sizes outlined, and the estimation of the money value of standing timber treated.

A short chapter (X) on Growth of Individual Trees and the Growth of Stands is also given. An index is provided and the book is illustrated by a map of the region and a hundred and forty half-tone cuts.

Wood Identification.

Prof. Record's book* consists of a general discussion of the properties of wood and a key for the identification of the economic woods of the United States.

Part I of the book deals with the structural and physical properties of wood in general. It discusses, in turn, the structure of the tree, the structure of the secondary wood, the nature of the individual elements that go to make up the secondary wood and their arrangement and relation to one another. Peculiarities of wood structure, such as tyloses, pith checks and bark of wood are

also dealt with. The writer's definition of "grain" and "texture" should tend to remove the confusion that so often arises from the injudicious use of those terms. In dealing with physical properties the writer merely gives a brief outline of the extensive and little understood subject. The use of the structural and physical properties and of such chemical properties as color and taste for the purpose of identification is briefly indicated.

Part I of the book is, practically speaking, only an elaborate index to the subject of timber physics and the literature relating to it. Following the description of each of the properties of wood is given a list of the available references on that particular question. This should make the book of great value to those who wish to study the subject more exhaustively.

Part II, the identification key, is a very complete compilation of characteristic properties of the important woods. The grouping and classification generally is both clear and concise. The identification of individual species is dependent to an enormous degree by means of microscopic examination. Many of these key tests, which are based on the microscopically important, should prove of great value in distinguishing between the woods of closely related species where sometimes such distinction has been difficult or impossible. Species determination using wood

**Economic Woods of the United States*, by Samuel J. Record. New York: John Wiley & Sons; London: Chapman & Hall. \$1.25.

woods are seldom consistent, and, while they may serve to tell certain specimens apart, they cannot be relied on in the majority of cases. This difficulty also applies to deciduous woods, but to a lesser degree, as the individual peculiarities of a species are usually more consistent with these woods. Distinctions that rely on the difference in color between heartwood and sapwood are freely used, in spite of the fact that these are useless with small hand specimens, in the majority of cases. The writer attempts to distinguish between the woods of the four Southern pines and of the different species of spruce, but explains that the distinctions are not always reliable. The gross distinctions are not clearly distinguished from the microscopic ones, and the peculiarities in cross-sections are liable to be confused with those of radial or longitudinal sections. The identification key is also accompanied by a complete list of references to the existing literature.

The book was designed for the use of foresters, timber inspectors and wood-users, but would be of more value as an outline of a course of study than as a handbook. It is a trifle too technical for the average wood-user, but should be invaluable to forestry students.

A forest map of the United States and a series of thirty photo-micrographs of characteristic wood sections is appended, and the introduction contains a brief outline of the methods of preparing specimens for microbotanical study.

The Larch Saw-fly.

The Large Larch Saw-fly, the subject of this bulletin*, is no doubt the most widely known species of insect destructive to forests in Canada, though of late years the Spruce Budworm has come into prominence. Over the whole of Eastern Canada this saw-fly has killed wellnigh all the tamarack, or larch, and of late its ravages have spread to the middle western provinces of the Dominion.

The Dominion Department of Agriculture is fortunate in having in its employ, as Dominion Entomologist, in the person of Dr. Hewitt, one who has given to the insect an amount of study and careful investigation such as no other student of entomology has bestowed on it. The results of

*The Large Larch Saw-fly (*Nematus erichsonii*) with an Account of its Parasites, other Natural Enemies and Means of Control, by C. Gordon Hewitt, D.Sc., Dominion Entomologist. (Dominion Department of Agriculture, Experimental Farms, Bulletin No. 10, second series: Entomological Bulletin No. 5). Ottawa: Government Printing Bureau, 1912. Pp. 42. One colored plate, four half-tone illustrations and 22 figures in the text.

his investigations up to the present, both in England and Canada, are embodied in this bulletin. The first part of the bulletin is taken up with an account of the history and distribution of the insect, the technical description of it and an account of its life-history. This is followed by a discussion of the injury to trees (through oviposition by the mature insect and through defoliation by the larvae). A point of special interest to foresters is that Dr. Hewitt has found the saw-flies on the Japanese larch (*Larix leptolepis*), generally supposed to be immune. Natural enemies described are field mice and birds. Special attention is given to parasites and predaceous insects; some twenty or more insect parasites and one predaceous insect are described. The study of Dr. Guessow, Dominion Botanist, of the parasitic fungus *Isaria farinosa* is also outlined at some length.

Much of the practical value of the bulletin lies in the section on Preventive and Remedial Measures. Constant vigilance, care in planning a plantation (not planting larch 'pure,' i.e., as the only species in the plantation) is urged, also the encouragement and protection of birds. Remedial measures for small plantations include spraying, destruction of cocoons, hand-picking, jarring the trees and banding.

The most hopeful means of restricting or stopping the spread of the insect is the aiding of the natural enemies of the insect by fostering its natural parasitic enemies. An outline of the work already done at the Central Experimental Farm is given. A short account of the economic value of the larch is included in the bulletin, credit for which is given to the Dominion Forestry Branch.

The author, Dr. Hewitt (Dominion Entomologist, Central Experimental Farm, Ottawa) will be glad to receive information in regard to the insect. Copies of the bulletin may be obtained by applying to the Publications Branch, Department of Agriculture, Ottawa.

Dr. Schenk's 'Sylviculture.'

Under the title of 'The Art of the Second Growth, or American Sylviculture,' Dr. C. A. Schenk, Director of the Biltmore Forest School, has issued a revised (third) edition of his 'Biltmore Lectures on Sylviculture.' The form and arrangement of the work remain the same. As compared with the first edition many emendations are to be noted, and a number of changes in nomenclature, e.g., 'sprout' forest instead of 'coppice' forest, 'composite' instead of 'coppice under standards,' 'seed' forest taking the place of 'high' forest. The book is, as always, a handy manual of the art, and is worthy of a place in every forester's library.

An Elementary Manual.

Prof. Chapman's *Forestry: An Elementary Treatise** is truly named an elementary treatise. Mr. Chapman tells little new about forestry, but his book is none the less useful for that. In a popular form he has told the elementary facts about forestry in thirty thousand words—between four and five pages of the average daily newspaper. In the book itself this means eighty pages of large type, easily read because of the nature both of the writing and the printing. Among the subjects dealt with are: Relations of Forestry to Government; Scope of Forestry as a Profession; American Forestry; Silviculture; Fire Protection; Tax Laws

Forest Ventures and Forest Prizes.

The book is a brief, clear statement of the position of forestry on this continent and of the subjects of those concerned in forest conservation. It is useful in distinguishing between what is practical in Europe and what is possible in America. If the information contained in this little book were widely distributed in America the problems of forest conservation and utilization on this continent would be much more solution than they are today.

**Forestry: An Elementary Treatise*, by Hermann H. Chapman, M. F., Asst. Prof. of Forestry, Yale University. Published by The American Book Company, Inc., U. S. A. Price, \$1.25.

Forest School Notes.

Brief Progress Reports from Three Universities

Prof. R. B. Miller, of the University of New Brunswick, in a recent letter to the editor, gives the following note as to the work in that university this year—

We have 25 students here at the U.N.B., and the interest is gradually increasing. By recent action of the Senate, acting upon the advice of Mr. Knechtel and myself, I have been put in charge of securing the college wood upon the college lands (some 100 cords) and will cut it in accordance with forestry regulations. We may also do a little logging on this tract and give the students some practical experience in thinnings, making roads, yarding and scaling logs, etc., right on our own lands. During the last year the students have mapped some 500 acres of the college lands and this winter will work up an estimate from our own volume tables which we will secure while operations are in progress. Three men will graduate this year, Robert K. Shives, Kenneth R. Machum and Harold B.

Murray. H. C. Balyas, 1911, and M. F. Howe, a former Sappamore are with Mr. Reginald Bradley as cruisers in the Tabique woods this winter. Prospects for employment for our men in Eastern Canada look very bright at present.

Laval Forest School Notes

The forest school of Laval University at the present time has the following attendance—

Class of 1914, 12 students; class of 1913, 15 students; class of 1912, 18 students, making a total of 45. Of these, thirty hold scholarships, which they obtained after passing several examinations in a general contest, which takes place every August. The others are students who are paying their tuition. Owing to the rapid increase of the school, there has now arisen the question of giving it larger quarters outside of the University. The Government and the authorities of Laval University are studying the problem, and likely the school will have a building of its own

before long. Another contemplated step is the organization of a school for the instruction of forest guards for the government and the lumber companies. A preliminary building is to be built this year at Berthierville, on the nursery grounds, and no doubt within two years the under school will be in operation, as there is a great demand for such instruction.

The lumbermen of Quebec are taking a great interest in the work of education. They have given employment to some of the students during their months of practise, and it is expected that they will co-operate before long in the organization of the chairs of lumbering, wood industries, etc.

University of Toronto Notes.

The Faculty of Forestry, University of Toronto, which graduated twelve students last year, has in the registration for the present academic year filled up its ranks to the number of 44, two old students who had interrupted their course returning and 17 new ones being registered. The graduating class has ten names, the first year of the four-year course eight names, the second year ten, and the third year five,

besides eight in the six-year course in various years, and three occasional students.

Most of the graduates found employment with the Forestry Branch of the Dominion Department of the Interior, and a few with the Canadian Pacific Railway Company.

The call for foresters, owing to the sudden organization of the British Columbia Forest Branch, has been so urgent that the Dominion Branch has not been able to retain all its men, and a number have joined the new department. The market for foresters has been brisk with consequent raises in salaries to an unusual level for young men, and altogether a hopeful development for employment is anticipated.

There have been no essential changes in the curriculum as followed hitherto, except that the practice camp has been held at the beginning of the session instead of at the end.

An unusually satisfactory location for the camp was found at Frank's Bay, Lake Nipissing, Ontario, where an old dépôt of the John B. Smith & Sons Lumber Company was at the disposal of the fifteen students who attended the camp, with two instructors, and a virgin stand of red pine (limits of the Strong Lumber Company), to be logged this winter, together with other types, gave excellent opportunity for practice work in forest survey, and gathering data for working plan, studying detail of types, constructing growth tables, etc.

The work was carried out according to careful plans and has been so complete and satisfactory with regard to red pine growth-studies that it is expected to publish the results.

Forestation on National Forests in the United States

By Theodore S. Woolsey, Jr., Asst. Dist. Forester, U. S. Forest Service.

United States government foresters have realized for some time the enormous task before them in order to artificially reforest land that should be perpetually timber-producing. The total area of National Forests is approximately 190,000,000 acres. It is estimated that there are 15,000,000 acres within the forests which have

been deforested and that half of this area is reforesting naturally at the rate of 150,000 acres a year. This leaves the enormous total of seven and one half million acres to be planted and sown artificially.

The policy is now pretty well established that watersheds should first be reforested, and then areas where a good stand of timber can be quickly obtained at a low cost and where the local need for timber supplies is

*Based upon the National Forest Manual and upon the report of the Forester for 1911.

greatest. Before commencing work on a large scale, it is felt that intensive experiments must be made in order to decide upon the best methods. To start with, the bulk of the reforestation is to be by direct seeding, concentrated on the best sites in the most favorable districts.

Prior to the fiscal year 1911, 13,775,000 acres had been reforested, mostly on an intensive scale; the result on probably at least ninety per cent of the area has been failure. These early failures were due (1) chiefly to the unfavorable sites; (2) because the work was so scattered that the rodents did an enormous amount of damage; and (3) because of insufficient care in planting and sowing. During the year ending June 30th, 1911, a total of 25,230.51 acres was reforested at an aggregate cost of \$133,802.01 or about \$5.30 an acre. In considering this low cost, however, it must be borne in mind that most of the area was merely seed-spotted, and probably complete success cannot be expected on more than, perhaps, 5,000 acres.

Two general methods were employed, namely, direct seeding on the best sites and planting thrifty nursery stock on the less favorable sites.* The direct seeding covered a total of 23,235.04 acres. This required an enormous supply of seed which was either collected by local officers or purchased. The conifer seed collected amounted to 52,798.45 lbs. at \$1.24 per lb.; the hardwoods, 10,632 lbs. at 11.6c per lb. The conifers purchased amounted to 26,734 lb. at a cost of 78c per lb.; the hardwoods 28,162.5 lb. at 3.6c per lb. The total amount of seed secured amounted to 118,326.95 lb. at a cost of \$88,616.60.

It has been determined that the cheapest and best method of securing satisfactory seed is by the purchase of cones, and seed extraction by the local force; seed collection should be concentrated in favorable localities

and during favorable years. It has been found cheaper to collect large amounts in good seed years and store for one or two years, than to collect during unfavorable seasons. Ordinarily, in the western United States, the best season for sowing has been the fall, and, since most of the seed ripens in September, it is necessary to collect seed the year before in order to have it available for fall sowing. The best place to store the seed is in sealed glass jars kept at a moderately low temperature. The Norway spruce seed purchased abroad (at 75c per lb.) has proved very unsatisfactory and there is a general hesitancy in using exotics under ordinary conditions. The cedar seed so generously donated by the Indian Forest Service did not germinate.

The sowing operations have been mainly by three methods: (1) broadcasting; (2) seed-spotting, and (3) corn-planting or dibbling. The broadcasting of coniferous seed on unprepared ground has resulted in failures and in the future most direct seeding will be by the seed-spot method with some corn-planting on very favorable ground. Taking the western United States as a whole, fall seeding has proved more satisfactory than winter or spring seeding, chiefly because fall sowing germinates four to six weeks earlier than spring sowing.

In the future the sites will be mapped in advance and will be poisoned with wheat both before and after sowing to curtail the damage by rodents. The chief species used in sowing are yellow pine, Douglas fir, with smaller amounts of Engelmann spruce, lodgepole pine, sugar pine, black walnut, white oak, and still smaller quantities of maritime pine and cork oak. The average cost of seeding by seed spot methods (spots placed 6 ft. x 6 ft. with twenty to thirty seeds in each spot), is \$4.08 per acre, but it is hoped that this cost can be reduced to from \$1.50 to \$1.00 an acre.

While most of the reforestation will be done by sowing, yet some planting

*Reforestation on distinctly unfavorable sites is not sanctioned.

will be attempted, chiefly for experiment. At present the Forest Service maintains seven large nurseries, with an annual capacity of from one to four million plants in addition to twenty-two small nurseries, and there are now 35,000,000 plants on hand for use during the next two years.

The policy of maintaining large nurseries rather than small ones has been pretty generally adopted, notwithstanding the shipping cost and the danger of the stock drying out in transit. A few years ago a large number of so-called ranger nurseries were established on almost every forest, but this proved expensive and unsatisfactory. Many of the rangers wasted time on their nursery work and it seriously interfered with their regular executive duties. The transplants in the past have averaged from \$8.00 to \$12.00 in cost per thousand, but it is hoped in the future that two-year-old seedlings (conifers) can be raised at 75c per thousand, and two-year-old stock once transplanted for \$1.75 a thousand.

Seedlings will be used only in the more favorable sites, and two-year-old stock, once transplanted, and occasionally three-year-old stock, once transplanted; or three-year-old stock, twice transplanted, on the more unfavorable situations. Yet it must be borne in mind that even planting will be confined to situations where there are excellent chances for success. For example, the Forest Service would not attempt to reforest a dry southern slope until the cool moist northern slopes had been planted. The chief species to be used in planting are yellow pine, Douglas fir, lodgepole pine, sugar pine, Engelmann spruce, with some eucalyptus and a number of other species for purely experimental purposes. The ordinary spacing is 6 feet x 6 feet. In the past plantations have cost, including nursery stock, \$20.00 to \$22.00 per acre; in the future it is hoped that this cost can be reduced to from \$8.00 to \$12.00 an acre.

The national forests which are situated in the western United States have been divided roughly into six administrative districts. They are as follows:

1. Montana, northeastern Washington, northern Idaho, northwestern South Dakota, northern Michigan, northern Minnesota, and southwestern North Dakota;

2. Colorado, Wyoming, South Dakota, Nebraska, and western Kansas;

3. Arizona, New Mexico, Oklahoma, Arkansas and Florida;

4. Utah, southern Idaho, western Wyoming, eastern and central Nevada, and northwestern Arizona;

5. California;

6. Washington, Oregon and Alaska.

This wide diversity of conditions naturally presents an enormous number of reforestation problems. At present, most of the reforestation is to be confined to the northern districts, namely, 1, 2, 4 and 6. In districts 3 and 5 the work will be chiefly experimental. The present budget calls for the reforestation of 30,000 acres annually; 1,000 acres in the two southernmost districts (3 and 5), and 29,000 in the northern districts. In Washington and Oregon the best results are expected from Douglas fir sown in seed spots; and in district one from yellow pine sown in seed spots. In Southern California the attempt to replace chaparral with a valuable timber species has been unsuccessful, and in the future the reforestation will be confined to higher elevations. The results from eucalyptus plantations in Southern California have been very poor, and the only results that promise success have been with seedlings in pots 2 in. x 2 in. x 8 in., so that they could be planted without disturbing the root system.

In Florida, maritime pine promises to be successful, and the species yields a larger quantity of resin than long-leaf pine and grows much more rapidly.

Continued on page 164.

With the Forest Engineers.

In the B.C. Forest Service

The following account of the location of the field staff of the British Columbia forest service has been kindly furnished by H. R. MacMillan, Chief Forester.

Mr. L. R. Andrews was engaged for the month of October and part of November in making a scientific study of the scale in the walls of the interior. His main operations were conducted in the mills along the line of the Crownest Pass lines of the Canadian Pacific Railway. He was assisted in this work by Messrs. A. M. Black, Wm. Creighton and Miller. Among other things Mr. Andrews reports excellent market conditions and efforts among some of the mill men to utilize very closely.

Mr. F. W. Beard was in the months July to September in charge of a party north of the Railway Belt between the Harrare and Adams Rivers. In this time he covered between 200 and 300 square miles and discovered considerable good timber not yet under license, as well as between twenty five and forty square miles of land which would be suitable for fruit growing. In October and November he took up the work of the detailed examination around Phoenix in the Columbia and Western Land Grant.

Messrs. Caythall, Edgeronnie and Kinghorn have been engaged in the issuing of G.T.F. permits to cut timber on Crown land along the line of construction for the purposes of tie-making. The feature of these permits is that all trees to be piled and barked within fifty feet of the right of way thereby making a total cleared strip of two hundred feet. Mr. Edgeronnie's work took him to Tête Jaune Cache, where, as the District Forester, he issued 120,000 ties of spruce and jack pine which had been illegally cut, and sold them at \$2.00 per M. feet, board measure. This price is reflective of the high demand which obtains along the lines of construction in Canada. He also issued two or three timber sales which are now under negotiation to dispose of the fire-killed timber. He has also been engaged in the collection of results on the timber cut. Mr. Caythall's work around Hazelton and Mr. Kinghorn's around Fort George have been of this nature also.

Mr. J. R. Gazeau has been in the Columbia and Windermere Valleys in reconnaissance work. The Valley has been burned over, and is now covered with reproduction. He has now come to take part in the survey of the Columbia and Western Land Grant on the North fork of the Kettle River.

Messrs. H. J. Marvin and A. V. Gilberg

have been engaged in a reconnaissance of the timber and agricultural lands in a narrow strip along the line of the C.T.F. from the Alberta boundary to a point 375 miles West. They have been endeavoring to find what land should be withheld and what timber sold. They have also been reporting on mill sites along the Fraser river.

Mr. J. D. Gilmour has been grading timber on lands for sale along the coast. The Forest Branch is now disposing of small bodies of turned timber and other timber that should be sold in order to be removed by operators in the vicinity as a means of saving waste. For some months he has been inspecting logging camps to learn how the new Forest Act is affecting operators.

Mr. A. M. Gold, who has come to the Forest Service after a long experience in Denmark, Germany and India, has had charge of a party making a detailed examination of lands near Eholt to determine what is good for timber and what might be used for agriculture.

Mr. L. S. Higgs this summer was in the Salmon River valley, Vancouver Island, engaged in a determination of the relative amounts of agricultural and timber land. He reports one valley which contains three and a half million feet (kilobassens) of timber. He also reports a valley of fine agricultural land covered with Douglas fir which is over mature. At the present time he is engaged in the same kind of examination in the Columbia and Western Land Grant near the south end of the Arrow Lakes.

Mr. O. D. Ingall has been examining timber for sales and examining logging operations in connection with Douglas. He is also examining land for which pre-emption have been removed, but which the Department is not quite certain whether or not should be withheld. On Nov. 10th he left for his examination of some lands in Bona Vista Valley on the West coast of Vancouver Island.

Mr. H. W. Lewis spent three months examining the timber included in various sales which the Department has on hand. One was in the vicinity of Adams Lake, and the remainder were on the coast. The Forest Act of 1906 stipulates as follows: "all that which began after 1906, but before 1907, were covered by the Canadian." Mr. Lewis's work has been in determining whether or not the lands should be allowed to be taken under pre-emption provisions under this legislation.

Mr. E. G. MacGregor has been engaged in the survey of the Victoria Valley of the Columbia and Western Land Grant. He will also endeavor to determine the effect of

the agricultural land and that which is only fit for growing timber.

Mr. J. B. Mitchell has been in the Omineca Country in the far North of the province making a reconnaissance and a report on the extent and character of the timber and the damage by fires. He is to send in recommendations regarding the methods of protection in the future. He will return to headquarters about Dec. 1st.

Mr. A. G. Mumford was in the country north of the new C.N.P. line near Kamloops. He will send in recommendations regarding the disposition of the land, based on its fitness for agriculture or timber. He has now joined the other members of the surveys branch in a similar examination in the Columbia and Western Land Grant.

Mr. T. H. Plumer has been making a reconnaissance around the Mabel Lake. He reports excellent timber conditions. He will stay the whole winter in the district making a reconnaissance on snowshoes. He has already cached supplies for the long work. His work takes him also to Rock Creek in the C. and W. Grant.

Mr. G. H. Prince has been cruising timber in the Upper Country and has made recommendations on four timber sales and on areas for which applications to purchase had been made. He also is now engaged in the survey of the C. and W. Land Grant.

Mr. W. A. Schell has been cruising timber in connection with timber sales and applications to purchase on the Coast; he is now making an examination near Tête Jaune Cache.

Mr. H. Claughton Wallin, who for some years has been in charge of timber surveys in the B. C. Railway Belt, with headquarters at Vancouver, has been appointed to the charge of timber surveys in the Dominion Forest Service, and has removed to Ottawa. The forest survey division will have charge of survey methods, preparations of instructions for survey parties, and compilation and mapping of the results of the survey.

Messrs. J. D. Gilmour, W. J. Van Dusen, L. R. Andrews and C. MacFayden have resigned from the Dominion Forest Service to accept positions with the British Columbia Forest Branch.

Roy L. Campbell, late editor-in-chief of 'Varsity', is engaged in the publicity work of the British Columbia Forest Branch.

G. A. Gutches, M.S.F., formerly with the Dominion Forestry Branch,

paid a short visit to Ottawa just before the Christmas vacation. He was on annual leave (which in the U. S. service is of thirty days' duration). Mr. Gutches is with the Indian Department Forest Service, and his work covers the six Southwestern States.

Forestation on National Forests.

(Continued from Page 162.)

In Arkansas, where shortleaf pine, the oaks, hickories and other broad-leaved species grow luxuriantly, the reforestation is confined to the introduction of more valuable species, such as black walnut, red cedar and locust.

In Arizona, New Mexico and California, yellow pine has been used almost exclusively, and very poor success has resulted except where the soil was moist at elevations above 8,000 feet. It is probable that it will be necessary to use transplants in these states.

The policy underlying this progressive campaign for reforestation may be interesting to members of the Canadian Forest Service, and it is very fortunate that the American Forest Service is so keenly alive to its obligations to reforest unproductive areas even at considerable expense. From the purely financial standpoint, there is no question but that it will not pay. At the end of a rotation of 150 years the compound interest charges at four per cent are going to amount to more than the value of the final product. The financial failure of this reforestation program is certainly realized in the case of yellow pine, because it will probably cost at least \$15.00 an acre to start, and at the end of 150 years will not yield more than 15,000 to 25,000 board feet per acre. Yellow pine today is worth only \$3.00 per thousand board feet on the stump. Therefore, the increase in stumpage price must be enormous in order to make the operation profitable.

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